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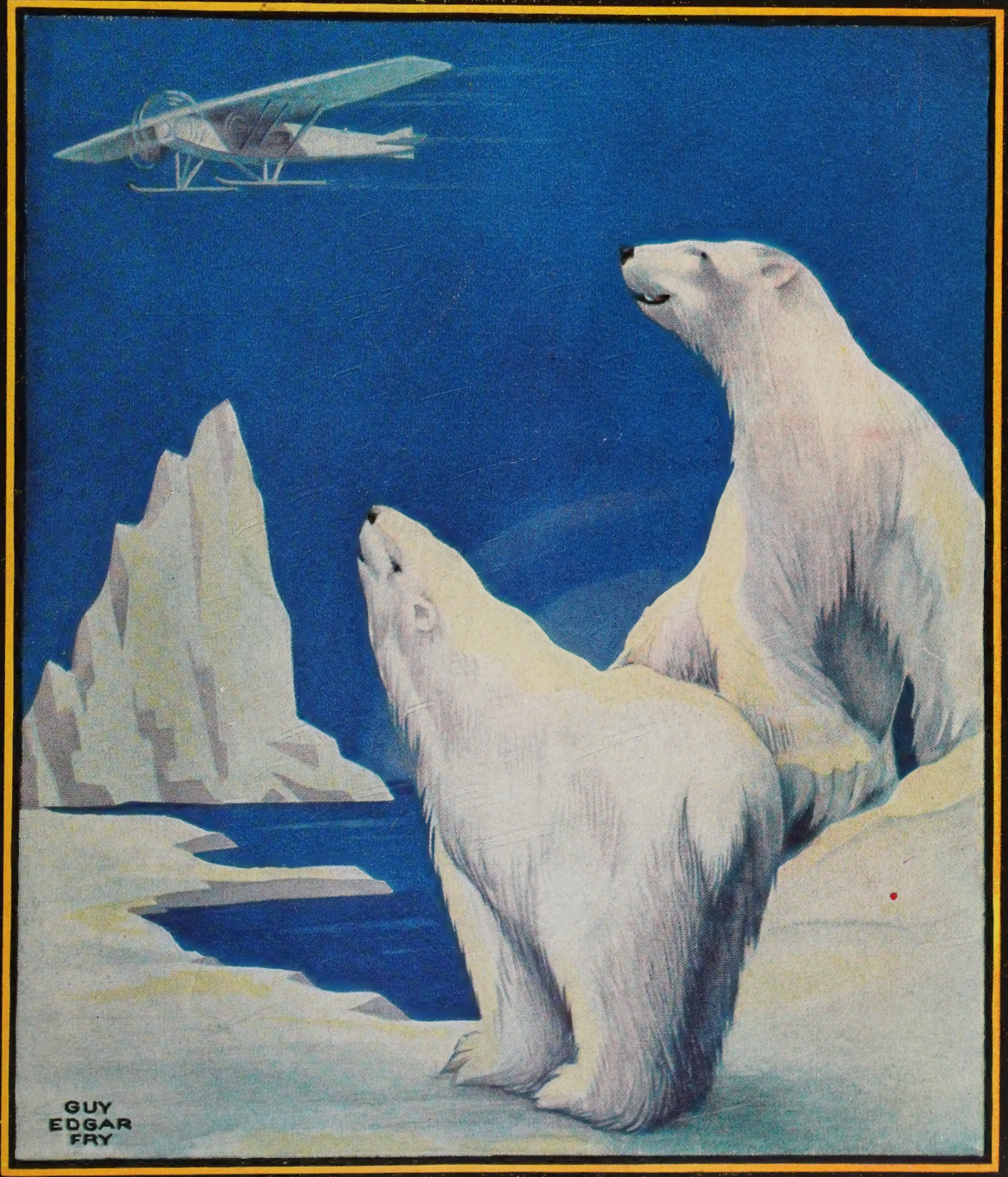

SEPTEMBER 1929 35¢ VOL. 14, NO. 3

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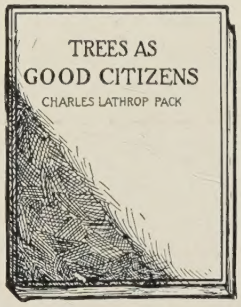

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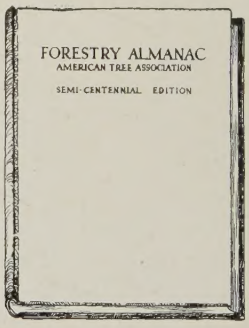

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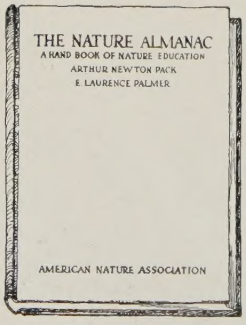

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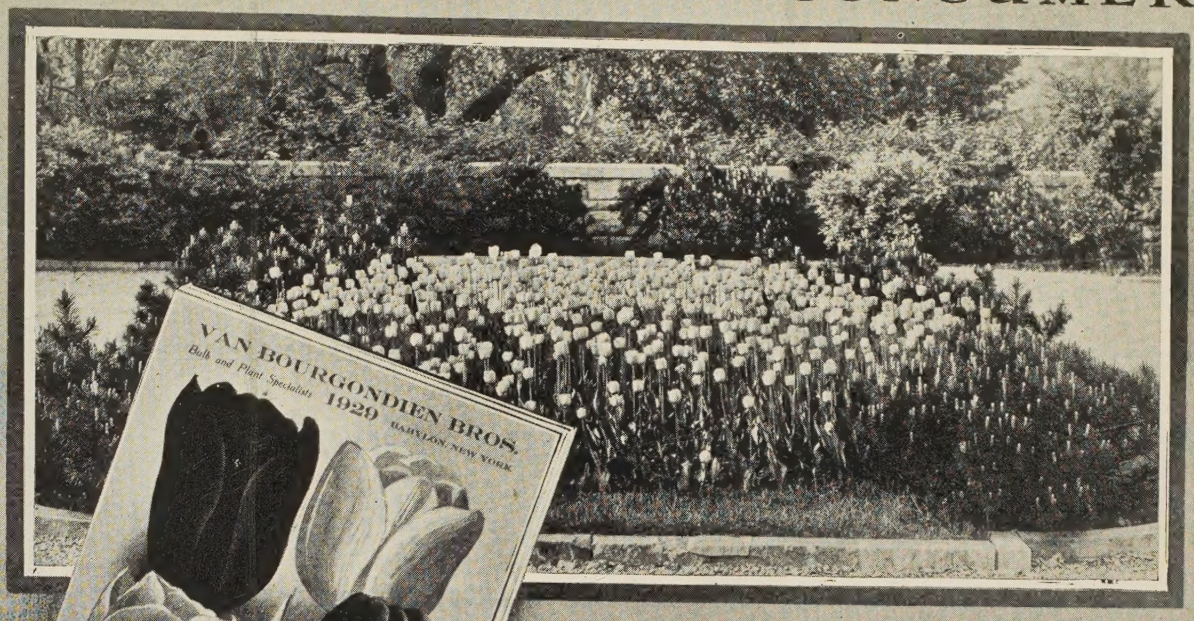

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  Reptiles (Turtles, Snakes, Alligators and Lizards)
Zoo Mammals
A Nature Bibliography, E. Laurence Palmer
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After reading the partial list of contents of the Nature Almanac—at left and below—any nature lover will realize that here is the book he has often wished for—and for only One Dollar.

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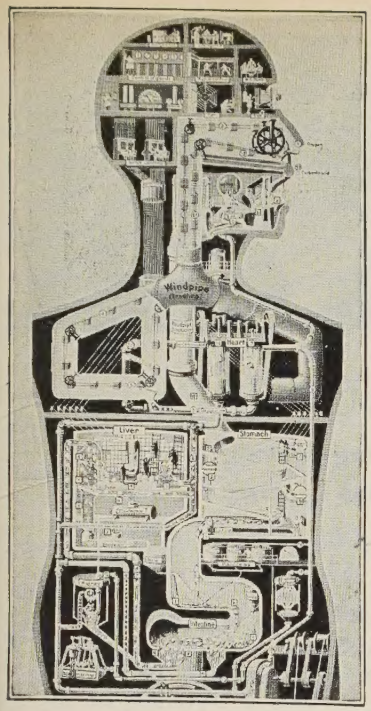

The Human Factory

In HYGEIA for September there will appear an extraordinary full page color insert—THE HUMAN FACTORY. This astonishing picture illustrates the functions of the human body, translated in terms of machinery—a formidable array of pumps, pulleys, engines, switchboards, cameras, filters, furnaces, wheels, belts, etc., carrying on the complex operations. Parents and teachers will find this graphic dramatization of life processes one of the most comprehensive and succinct explanations of human physiology ever presented.

The HUMAN FACTORY incidentally typifies the purpose of HYGEIA, the Health Magazine of the American Medical Association. It presents the things you want to know—the things you have a right to know, about your physical being, in non-technical, understandable terms. By giving you this knowledge HYGEIA protects you and your family against the evils of ignorance in preventing and combating disease.

watch for September HYGEIA all this and more!

Your Son Enters College

Parents feel the responsibility of providing adequate wardrobes for their sons and daughters when they go away to college, but have they properly prepared them for college from a health standpoint? Are they equipped to make the transition from home to college life without disaster and the crippling effects of disease? A valuable article by Morrill L. Ilsley, M.D.

Can You Relax?

What is meant by relaxation, and how is it achieved? What rests one will not necessarily quiet another's throbbing nerves, but the way relaxation is being taught in a small girls' college is told by Miss Louise Windle in "Can Relaxation Be Taught?" Miss Windle explains certain principles which will aid everyone in relaxing for power. The article is of general appeal.

Another Step to Make Flying Safe

Is it common sense or safe to permit a pilot with a physical imperfection to go into the air where you would not let a ship with an imperfection leave the ground? Dr. John A. Tamisiea, medical examiner for a large air transport company and also for the department of commerce, discusses this important step which is going a long way toward making flying safe. His article is "Keeping Air Mail Passenger Pilots Fit."

Achieving Beauty the Health Way

When girls see that good health habits actually improve their looks, then bad habits will go the way of hoops, bustles, and the hour glass figure of the Gibson girl, Miss Thresa Dansdill writes in "The Beauty Approach in Health Teaching." Sketches of the lingerie worn by the college freshman of '93 afford an interesting contrast to the scanty apparel of the present-day girl.

It May or May Not Be Your Heart!

Although the heart ranks first in the mortality statistics of the country it is comforting to know that one-third to one-half of the people who think they have heart disease are mistaken. Dr. Reid, in non-technical terms, informally discusses "Simulations of Heart Disease" and tells how the heart, like the stomach and other organs displays symptoms due to disease elsewhere.

Other Special Articles

Simple Lessons in Human Anatomy
Part Six of the Series, continued; "The Bones", by B. C. H. Harvey, M. D.

Schools and the Physically Handicapped Child
Hugh Grant Rowell, M. D., urges giving physically handicapped children their educational rights.

The Nursery School
Classified by Frank Howard Richardson, M. D., as one of the most important educational advances of the century.

A Stutterer's Psychology of His Own Case
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who made these remarkable pictures on the two recent Pack-Finley expeditions into the northern part of the Rocky Mountains, under the auspices of the American Nature Association, will lecture with them personally during the coming season of 1930

You who have read the story of the expedition, appearing in Nature Magazine during 1928 and again in the recent 1929 issues, will be more than ever eager to see these pictures and hear Mr. Finley. Rocky Mountain Goats—outwitted by the use of a goat disguise, photographed within 50 feet. Moose—that threatened the cameraman, and at one time came too close for his comfort. Beaver—photographed in the wild, cutting branches and building a dam. Bighorn Sheep—high up on the mountain passes. Pronghorn Antelope—photographed from a pursuing automobile travelling at 45 miles an hour. Herd of Elk—fording a river. Bears—raiding the camp. Conies, deer, marmots, ptarmigan, jays, Franklin grouse or fool-hens, and other birds of the high peaks.

Dates for the coming season should be arranged as soon as possible by addressing

EXTENSION DEPARTMENT, AMERICAN NATURE ASSOCIATION
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IT used to be the good old custom to end all travelling on or before Labor Day, and be back at the desk, sunburn, fly bites, experiences and all to languish during the glorious September and October days. But now, these months are the shank of the vacationing season—and with reason, for the heat is gone, the flies have either become surfeited or slowed up, and the colors of fall are creeping out. And there is always the comforting thought that on the return there will not be a month or so of warm weather to wear away the vacation gains.

* * *

Though the European season is not yet over, the travel minded will look more and more toward South America, the Scandinavian Peninsula, or new places in America rather than toward the "continent." In South America, below the equator, the seasons are reversed, and September is just ushering in the spring. The Munson Steamship Lines offer attractive "students' cabin" tours, low-priced, congenial and comfortable, from New York to Rio de Janeiro, Buenos Aires, and return, ranging in price from $242 to $1281, and in time from 32 to 60 days, depending upon places visited. In a number of the trips, rail journeys inland are included, and in each city visited, special sight-seeing busses are provided. These tours have been very popular other months this summer. The same company also arranges journeys up the West Coast, and across the Andes.

* * *

With the lull between revolutions now occurring, Mexico offers Americans a most pleasurable vacation, particularly if they can get inland from the coast to Mexico City. The Ward Line has a number of interesting jaunts planned, particularly a 25 day cruise from New York to the Mexican capital via Vera Cruz. You will change all your ideas about the Land of Rebellions once you really have been there. Havana is another more southernly port lifting its head above the retreating summer heat, to which The Ward Line will convey you. There is Morro Castle, and Cabanas Fortress, and hundreds of other interesting sights in this Paris of the Western Hemisphere.

* * *

The land of the midnight sun—the Scandinavian Peninsula—will make a strong bid for the tourist traffic that starts its flow toward the summer's end. Sweden particularly will receive its full share, due to the fact that it has completely waked up to the possibilities of tourist trade, and makes every effort to show the visitor the most interesting sections of the country. Sweden leads the world in bus line mileage; it is possible to travel direct from Karesuando, above the Arctic Circle, to Oestratorp, south in Scania, a jump of 2,014 miles, entirely by motor, and each province is honeycombed with good roads leading to the heart of the real Sweden. The sea voyage to the Peninsula is delightful, especially in summer; but for those in a hurry, still more wonderful is the ten-hour Scandinavian Air Express, from London to Stockholm by way of Paris, Brussels, Rotterdam, Hamburg and Copenhagen. The fare is £11 6, but it is worth it. Vastergotland, the home of five thousand year old tombs and relics from the Bronze age, and the repository of the history of the early white race, and Dalecarlia, in the heart of the old Sweden that is passing, will amply repay a trip even if no other provinces are visited.

* * *

A new addition to the Panama Pacific Line, operating fortnightly service between New York and San Francisco, was made by the recent launching of the 34,000 ton turbo-electric liner *Pennsylvania*. At the same time the *Mongolia* was withdrawn from service to maintain the high level of equipment the line furnishes. The new ship is 613 feet long, and designed for 800 passengers.

* * *

With the inauguration on July 7 of the transcontinental combined air and rail service by the Transcontinental Air Transport, Inc., in conjunction with the Pennsylvania Railroad and the Atchison, Topeka and Santa Fé line, New York comes within two days of Los Angeles. Leaving New York at six p. m., a crack train connects at Columbus with a multi-motored plane, which meets a Santa Fé flyer at Waynoka, Oklahoma, for the second night leg of the journey. Planes are again taken at Clovis, New

Mexico, and Los Angeles is reached before evening of the second day. With this service available, there is no reason for not knowing "America first", at least superficially.

* * *

For those preferring the ground to air travel, the Santa Fé offers the Chief, the fastest train out of Chicago to Los Angeles. Leaving New York at 11 in the morning of a Monday, the West Coast terminal looms up at 11:30 p. m. Wednesday night. This is an extra fare train, but the California Limited, the Navajo and the Scout, regular fare trains, are but a few hours behind. And with the summer fares still in effect, any Easterner who does not discover the Pacific for himself this year is making an error of judgment. These trains make fine connections with the Indian-detour trips, which are probably as vitally important to an understanding of the history of the country as the poring over of many books.

* * *

Ex-President and Mrs. Coolidge set the fashion for Black Hills travel, two years ago. It has not yet let up, and with reason, for this section is as picturesque and rugged as any part of the nation. It was the cry —"There's gold in them thar mountings" —that started the first rush, under Gen. Custer, to this part of South Dakota but the real wealth there is the wealth of beauty. Bad lands, thick forests, towering monoliths, trout streams, needle formations cutting the sky like stalagmites on the floor of a cave, mountain-embraced lakes—here is Nature in a reckless mood, not yet touristed to death.

* * *

Those with a craving to go down to the sea in ships cannot fail to be satisfied with the line of tours offered by Merchants and Miners Transportation Company, with offices at Baltimore. Journeys from Norfolk, Baltimore and other southern points up to Boston are supplemented by motor cruises as far north as Bar Harbor and Nova Scotia, taking in historic and scenic sections of New England and Canada. Trips run from five to ten or twelve days.

* * *

When this copy of Nature Magazine reaches the subscriber, the third and last Glacier National Park Tour, personally conducted by a representative of the American Nature Association, will be leaving Many Glacier Hotel to camera mountain goats, gobble mountain air, and see one of the most beautiful of America's parks. When the tour is ended, the Association representative will travel up to Jasper National Park, to study the possibilities of including Canada's foremost beauty spot in next year's plans. We ask those interested in taking the trip another year to communicate with this department.

* * *

Something new in railroad equipment has been established by the Canadian National R. R. on many of their trains, in the form of "solariums", or cars whose rear sections have, instead of regular glass, vita glass which admits 85% of the health-giving ultra-violet rays of the sun.

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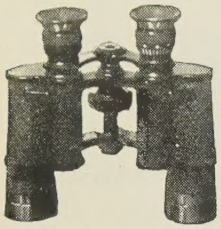

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NOTE—Nature Magazine desires to correct a typographical error made in its August issue where the price of "Du Maurier Ten Mile Eyes" was given as $12.75 for these glasses. The price should have been $21.75 as quoted above.

Added stimulus was given the use of amateur movie outfits with the announcement of the Kodacolor process. It proved to be easy for the amateur to handle and get results. Those who have acquired color equipment and those who have not are both interested in the why and how of this new departure. Their queries are well and concisely answered by Joseph A. Dubray, head of the Technical Service Department of Bell and Howell, in a recent issue of *Filmo Topics*. We quote Mr. Dubray:

"It is well known that three essential factors enter prominently into the making of Kodacolor pictures. All three of these essentials pertain to the optical system of the process, and are: (1) a three-color filter, (2) a photographic lens, (3) a great number (hundreds) of tiny embossings, on the base of the film itself, each of which acts as an extremely minute cylindrical lens.

"The multicolored light emanated by the subject passes first through the three-color filter (shown at the left), which analyzes the light into its components. A blue light, for example, will be absorbed and extinguished by the green and the red filters, but will pass through the blue filter. A light which can be divided into two components, such as a blue-green light, will be absorbed by the red portion of the filter, but will be transmitted through the blue and the green portions. White light, which is the result of the mixture of lights of all the different colors, will be analyzed by the three filters and each one of its fundamental components will pass through the

Mr. Caldwell Photographing the Grand Canyon

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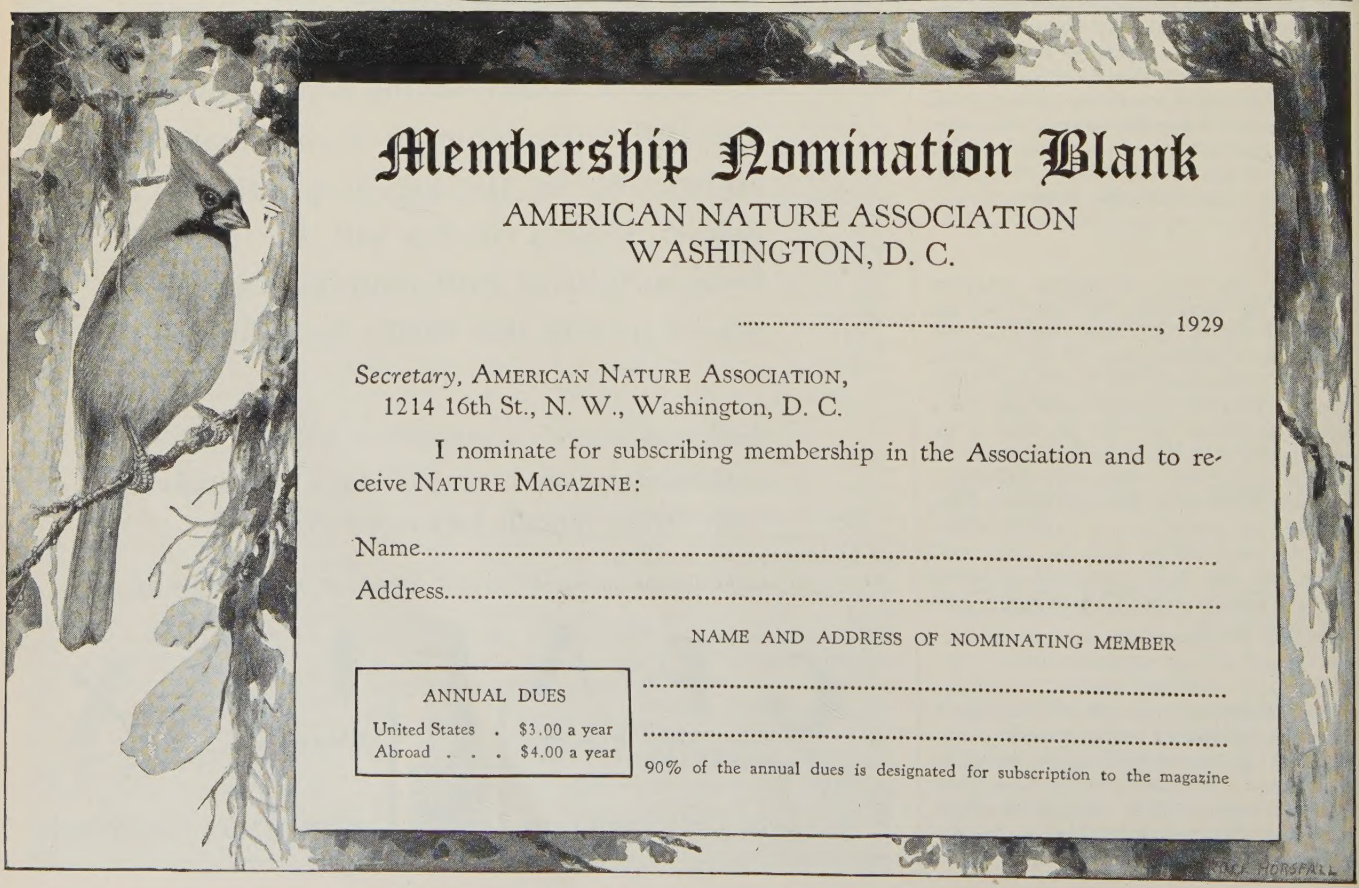

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portion of the filter by which it is transmitted.

"The mission of the filter is, then, that of selecting and distributing these different colored lights according to their fundamental components.

"The rays of light so selected then pass through the lens, the mission of which is that of any photographic lens, that is, to form an image of the subject on its focal plane which is coincident with the position of the film when it passes in front of the camera aperture.

"But in Kodacolor these rays of light, before reaching the focal plane, i.e., the sensitive emulsion of the film, are forced to pass through the hundreds of tiny embossed cylindrical lenses, the function of which is to lay, side by side on the emulsion, the colored rays which are emitted from each single point of the subject, and which are selectively distributed by the three-color filter.

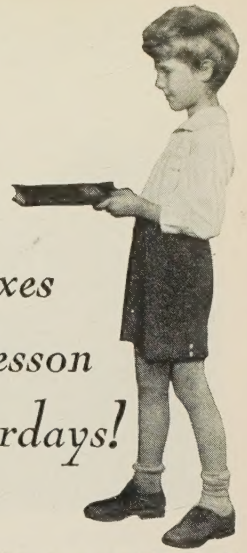
"In other words, these tiny lenses bring simultaneously upon the film the images of both the object and the three-color filter. Each one of these tiny lenses produces, therefore, *three* distinct images in the extremely narrow area of each film embossing, the width of which is 1/569th of an inch.

"The above description of the close relation existing between filter, lens and film embossing carries with it the conclusion that the three essentials of the Kodacolor process form but *one* complete optical system. It is easy to understand that a variation brought about in any one of the three essentials irremediably destroys the fundamental characteristics of the whole. The least imperfection in the setting of the filter or the neglect of keeping filter and lens perfectly clean results disastrously to the final picture.

"A combination of lenses or better, a compound lens such as a photographic objective, which is usually made of a combination of lenses of different materials and of different shapes. may be considered as one single lens, usually called the 'equivalent lens.' Such a lens, properly designed and assembled, gives as perfect an image as it is possible to obtain, although each one of the components, if taken separately, would produce a very defective picture. Similarly, in Kodacolor work the photographic lens in turn becomes only a part of the complete optical system. It must be combined with the other elements according to predetermined rules. This combination, and this combination only, becomes the real photographic lens of the Kodacolor system. The position of the distances at which these three elements are set are extremely important for the success of the ultimate photographic results.

"The color filter must be set at a very precise distance from the photographic lens and its colored sections must be perfectly perpendicular, to correspond with the tiny longitudinal embossings of the film.

"The photographic lens produces not only an image of the subject which is being photographed, but also an image of the filter, which is picked up by the small embossed lens on the film. Since the embossings of the film are always of the same size and form, the image of the filter must necessarily be formed at a carefully determined position and must always possess the same characteristics, hence the necessity of always using a lens of a predetermined and constant focal length."



Bob coaxes for a lesson on Saturdays!

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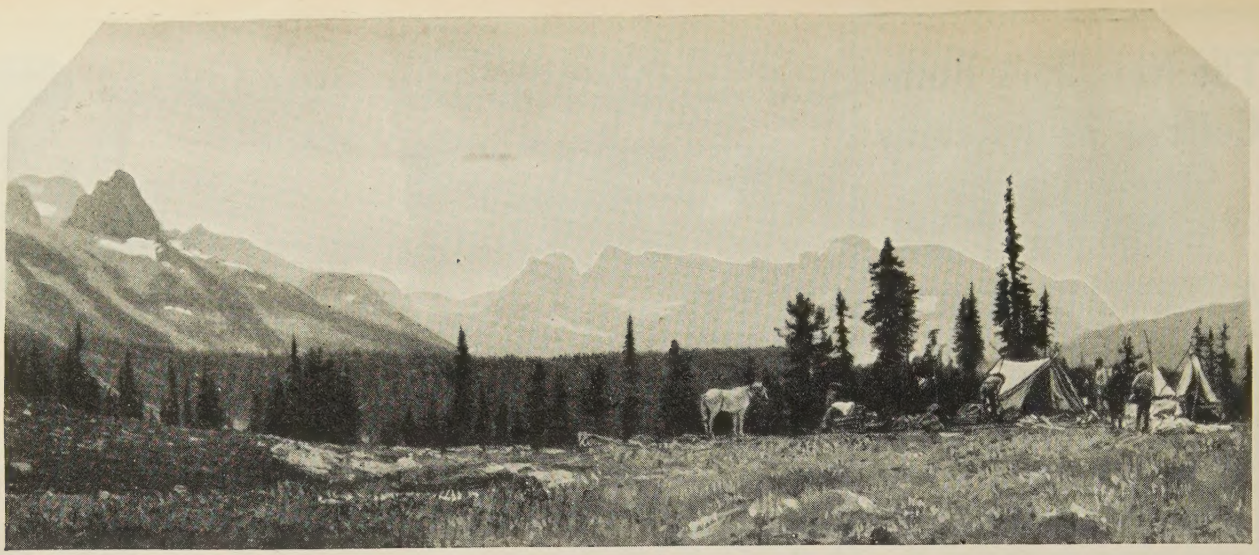

AT GRANITE PARK, IN GLACIER

At the left is the Garden Wall, and in the background, the "Shining Mountains". When this issue appears, members of the Third Nature Magazine Glacier Park tour will be just about crossing this meadow on their way through the Land of Wondrous Sights

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NATURE CALENDAR

SEPTEMBER

by E. Laurence Palmer

IN SEPTEMBER many a family will be thrilled because of the fact that some one of its number starts off on an eventful experience. The little tots will begin work in kindergarten and some of the older ones may leave the community in which they were raised to get new experiences in colleges.

Interestingly enough, September was the month in which Magellan started the first voyage which was to take a human being clear around the earth and the journey ended on September 8, 1522. In 1609, or just three hundred and twenty years ago this September, Henry Hudson sailed up the Hudson River as far as Albany and may have been one of the first white men to view the glorious colors of the hard woods in that month in that region. Even in those days there must have been something to incite an independent spirit in those who lived in this country, for we find Hudson faced with a mutiny which later on resulted in his being abandoned in an open boat in Hudson Bay. The initial trouble, however, started in September in the area later to be occupied by New York State.

September also finds a place in the history of the western part of the United States. We find for example that the famous Lewis and Clark tour through the Northwest ended at St. Louis in September, 1806. Since the usual summer tourist ticket of the present usually expires in September there will be not a few of the readers of this magazine who will be completing their tours at about the same time of year that Lewis and Clark got back to St. Louis. None of these extensive tours, however, may compare in importance or thrill with the initial trips to kindergarten made this month by thousands of children throughout the world.

The fall migration of children to school is not of course comparable with the fall migration of birds to the South or with the migrations of insects and of mammals other than man. There is a difference between instinct and intelligence though sometimes it would seem that the border line is not sharply marked. The instinct which compels some of the wasps to hunt their prey even though it is supplied them, to paralyze it though it is already paralyzed, and to attempt to crush its head though it is already crushed is worthy of notice for a number of reasons. Most of us do many unnecessary things, some possibly because of instinct but many because of habit. Recognition of absurdity in the behavior of other living things may cause a few to recognize absurdities in their own behavior. Schools help young human beings to make their activities count. Strangely enough, many of the practices carried on in schools have little reason behind them and are heritages of times when the laws of learning were not so well understood as they are at present. Much of the work done two decades ago in arithmetic, reading, spelling and geography was as absurd as the activities of the wasps that tried to crush a caterpillar head that was already crushed and so on. And it cannot accurately be said that all schools are today using methods different from those used twenty years or ten or five years ago. Progress in education seems often turtlish slow.

Though it may be difficult and from some viewpoints entirely unsatisfactory, it would seem that much profitable work could be done by children in trying to recognize in birds and mammals, in insects, fish, reptiles and amphibians some signs of intelligence as distinguished from the accidental or instinctive activities. If generalizations made by untrained individuals are not taken too seriously they will have their advantages. The individuals making the generalizations should be willing to modify them to accord with newly observed facts. Such open-mindedness will be valuable in training for good citizenship and Nature work in school may lend itself as a splendid vehicle for its development. May an increasing number of schools recognize this with the opening of school in September and instead of cramming children with laws already worked out, allow them to find out from their own study of the facts as many general rules as possible. Predigested knowledge wears away.

"THE GREAT KING OF THE AIR PURSUING HIS VASSAL
AT HEADLONG SPEED"

NATURE MAGAZINE

Volume 14
Number 3

September
1929

"FOUR LONG-WINGED, GRACEFUL SKIMMERS OR SCISSOR-BILLS—"

"OCCASIONALLY A LOON . . .

. . . OR RAKISH CORMORANT"

At CURLEW TOWN

Past Which Life Passes Like a Pageant

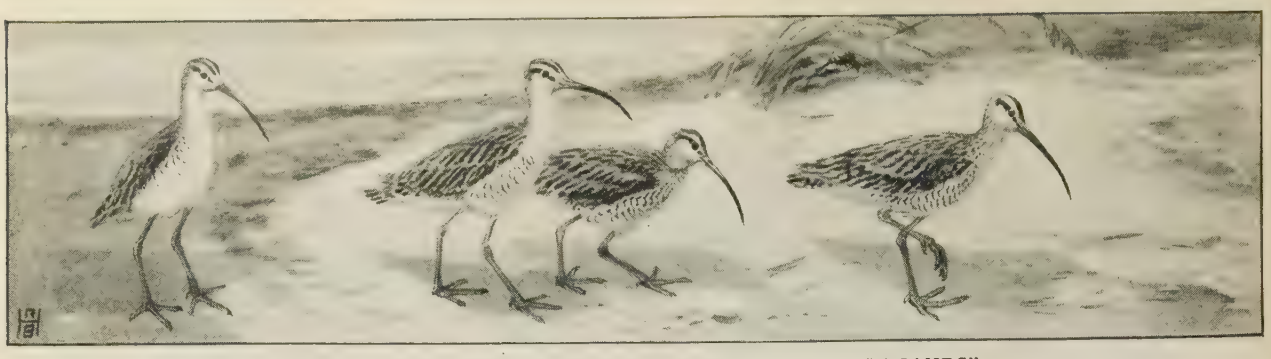
by Herbert Ravenel Sass

Illustrated by R. Bruce Horsfall

"ONE has only to sit down," wrote John Burroughs, "in the woods or fields, or by the shore of the river or lake, and nearly everything of interest will come round to him—the birds, the animals, the insects . . . He has only to stay at home and watch the procession pass." Hudson expresses much the same thought. "It is little to a man's profit," he says, "to go far afield if his chief pleasure be in wild life, his main object to get closer to the creatures, to grow day by day more intimate with them and to see each day some new thing. Yet the distance has the same fascination for him as for another—the call is as sweet and persistent in his ears."

It is an alluring call, and no wonder we heed it often. There are new and strange sights over the hazy hills, beyond the blue woods of the horizon, around the next bend of the path; and man was meant to use his legs. But to use them too much, though not so bad as using them too little, is, nevertheless, a mistake. Life passes like a pageant for him who waits to see it pass, sitting quietly in one spot with a watchful eye for travelers upon the road.

You must, of course, choose your spot with some discretion. Two springs ago I chose a spot and built a little house there—a cottage named Curlew Town, with a wide outlook over marsh and water, and a front porch, or piazza as we call it here in Carolina, shaded by tall palmetto trees in which the sea winds make a



"THE CURLEW FLOCKS PARADE SLOWLY OVER THE SANDS"

pleasant whispering music. There I often go for visits of a few days or perhaps a week or more, to be strenuous or lazy as I choose; and there, on lazy days, I have sometimes played the part of a rocking-chair naturalist, one who sits in a rocking-chair on his piazza or in his front yard, a field glass within easy reach of his hand, and watches the wild life that passes as he waits.

Two roads run past the little house that I call Curlew Town. One road is the broad blue highway of the air; the other is a long, serpentine water road—a deep, tidal saltwater creek which, after meandering for miles through the marshes, flows close beside the house and presently finds its way into the Atlantic. The air road is the more populous; perhaps the water road is the more mysterious, in some respects the more fascinating. There is mystery in all winding waterways. I never know what strange or beautiful thing will come gliding around the bend of the little marsh-bordered river that sweeps in from the broad, lonely salt meadows almost up to my front door.

Scaup ducks in their season float down stream with the ebb and swim slowly past the house as though no house were there. Sometimes shy red-breasted mergansers cruise along so close at hand that I might toss a biscuit over them, and now and again comes a burly black duck, perhaps the wariest and the wisest of its tribe. Occasionally a loon glides around the bend where the creek curves towards the sea, or a rakish cormorant swims past, scanning the water keenly for the fish upon which he feeds. In spring many willets fly up and down the stream, uttering their loud, repeated cries; spotted sandpipers in twos and threes or in small flocks haunt the sloping shores; slim-bodied, elusive clapper rails steal silently out of the bordering marsh and walk along the muddy margins exposed at low tide. On warm sunny days, when the surface of the creek is like glass or is only gently ruffled by the light breeze, an exquisite picture of bird life may be seen—three or four long-winged, graceful skimmers or scissors-bills, jet black and snowy white, flying side by side and plowing the water with their long, knife-like, bright red bills as they skim swiftly onward just above the surface.

It is the water road of the creek that brings to Curlew Town its largest and strangest visitors. From the open ocean, not more than half a mile away, following the windings of the stream, big dolphins or porpoises, from seven to nine feet long, occasionally swim past the house in pursuit of the mullet and other small fish with which the creek abounds; and now and again in summer a six- or eight-foot alligator, his sinister head and two-thirds of his black, jagged back showing above the surface, glides slowly into view around the upper bend, a wanderer from the freshwater lagoons and the great inland swamps, cruising downstream with the ebbing tide and perhaps coming to rest on the sloping bank within fifty feet of the piazza.

The sight of a 'gator brings a thrill, for although 'gators are common in this region, they are seldom seen in the saltwater rivers and creeks. Sea turtles, too, huge barnacle-encrusted creatures weighing four hundred pounds or even more, come up out of the surf on summer nights to lay their eggs in the sands in front of Curlew Town, and undoubtedly they sometimes roam up the creek beside the house, although I have never happened to see one there. Yet, though the water road brings these uncouth and fascinating monsters, I think I like the air road best.

Directly in front of Curlew Town, almost hidden in its palmetto grove, one looks out across a level plain of marsh at the ocean beach, less than a quarter of a mile away, with the surf breaking along its outer edge; and this side of the beach and protected by it, the marshes stretch for miles northeast and southwest, filling all the space between the blue ocean in front and the woodlands behind. There are days when the watcher at Curlew Town sees comparatively little bird life in the wide expanse of air above marsh and beach and ocean; but there are other days when an almost continuous stream of life flows along the broad air lanes, so that scarcely a minute passes that does not bring some wayfarer winging by.

"NOW AND AGAIN . . A SIX-FOOT ALLIGATOR"

What will that wayfarer be? There is no telling. It may be anything from a blue goose to a marsh wren, from an eagle to a nonpareil or painted bunting. A flock of Hudsonian curlew has just passed—for the moment the sky is empty, but only for a moment. A big bird comes into view, flying

TURNSTONES, MARVELOUSLY BEAUTIFUL BIRDS

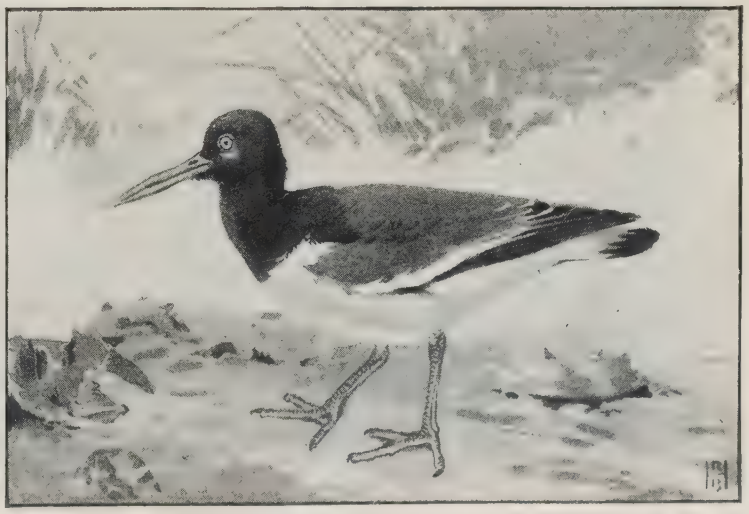
slowly with measured beats of its wide wings: a great blue heron, its long neck gathered in a loop, its long legs trailing behind. A squadron of knots or robin snipe sweeps low above the marsh blades in close, compact formation, the whole flock moving as a unit; then, sailing along in single file, come seven big brown pelicans, just visible above the strip of beach, sometimes dipping out of sight behind the rollers of the surf. Least terns glide here and there in graceful swallow-like flight, their long pointed wings caressing the air. Little blue herons and Louisiana herons pass at frequent intervals; now and again a stately, immaculate American egret sweeps slowly by, while snowy egrets, all but extinct twenty-five years ago but now abundant once more, glimmer above the marshes as they wing onward. Flocks of the smaller shorebirds pass from time to time—red-backed, semipalmated and Western sandpipers and small companies of turnstones and semipalmated plovers. Herring gulls and ring-billed gulls move back and forth above the beach and the ocean, while nearer at hand a company of beautiful, black-headed laughing gulls swings onward over the marshes.

Not all the travelers pass on. In front of Curlew Town the creek makes a sharp bend, and in the angle of this bend a small sandy flat, perhaps an acre in extent, thrusts outward into the marsh. There some of the wayfarers alight, and there they are in plain view and close at hand. The curlew flocks stop often to stand at rest or parade slowly over the sands, their warm colors glowing in the sun. Loquacious willets and handsome black-bellied plovers linger there, while turnstones, marvelously beautiful in their strikingly variegated nuptial plumage of white, russet and black, walk quickly about in search of little fiddler crabs. With these larger shorebirds I frequently see many of the smaller sandpipers and plovers, and sometimes snowy egrets, little blue herons and clapper rails visit the marshy margins of this sandy flat. Most interesting of all the visitors to be seen there are the oystercatchers, among the handsomest and most distinctive of the beach-loving brotherhood because of their large size, their long, bright red, chisel-like bills and sharply contrasting color patterns of glossy black, brown and pure white.

Watching these birds, with an indescribable delight in their varied forms, their graceful and characteristic movements, their rich colors and delicately penciled markings, the eye lifts now and then to the expanse of air above and beyond them where, every minute or so, some new traveler appears. Spring is perhaps the best of all seasons at Curlew Town, but there are autumn days that rival the loveliest that the spring affords. Then come companies of black terns, now strangely speckled and mottled, sweeping so low above the marsh that sometimes they touch the tips of the tall salt grass; flocks of cormorants in wedge-shaped battalions or in long, undulating lines which at a distance resemble black flying serpents weaving through the air; great white Caspian and royal terns with forked tails and crimson bills; herons and shore birds of many sizes and kinds; marsh hawks both brown and gray, and, in smaller numbers, other hawks, with now and then a great bald eagle sailing high or powerfully beating the air with his broad wings; barn swallows, not as a rule in flocks but in long loose caravans, bird following bird at intervals of several minutes, swooping and swerving with matchless grace above the miles of marsh; grackles and blackbirds and many other smaller folk journeying towards the warm lands where they will spend the winter.

It is during the seasons of migration, when thousands of feathered voyagers are moving northward or southward along the great migration highway skirting the shoreline of the continent, that the air road leading past Curlew Town is most populous. Always, however, that road is worth watching. Even at the dullest of seasons, no matter how empty and deserted it may appear, another minute may bring some unexpected visitor into view; and regardless of the time of year, the airy spaces overhead are seldom empty long.

OYSTERCATCHER, A HANDSOME, DISTINCTIVE BIRD



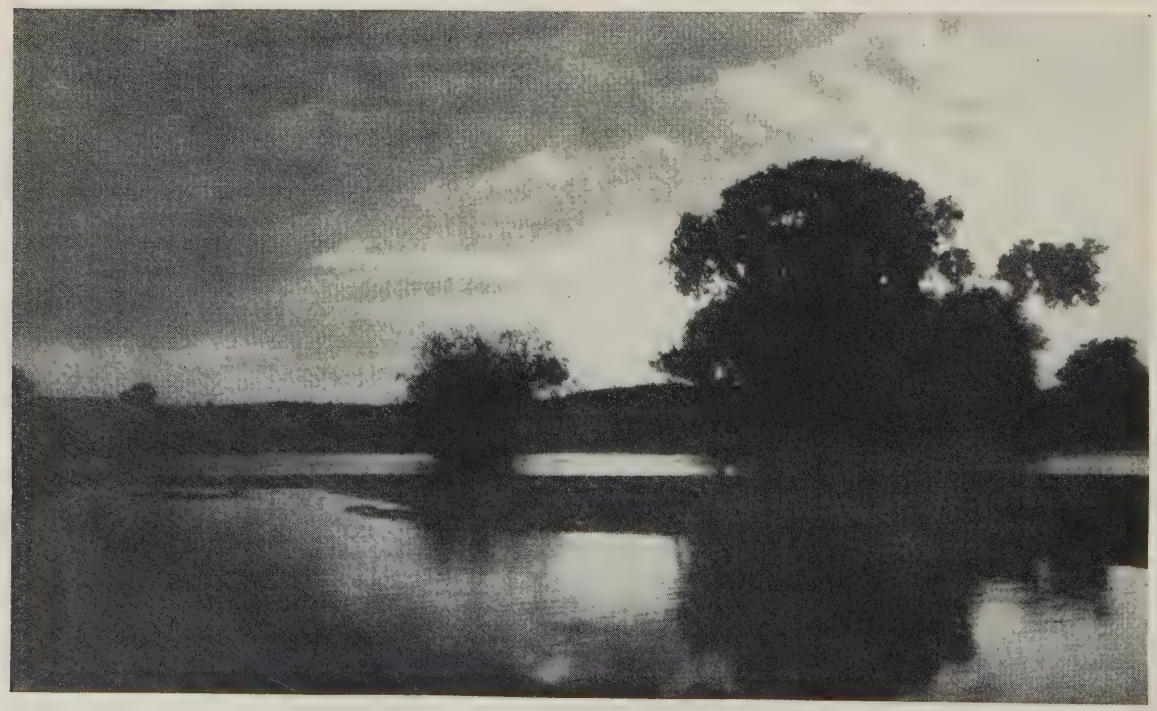
Of great soaring birds the turkey vulture and black vulture are the most abundant; but often I see the bald eagle sailing on motionless pinions perhaps a thousand feet above the earth; and the osprey, too, is a familiar visitor, wheeling above the marshland waterways in endless interweaving circles, poising now and then in mid-air to fall like a thunder-bolt upon some mullet or catfish that his keen eyes have spotted in the water under him. Sometimes, when he plunges thus, the eagle is watching him from far off, and you may witness that stirring sight which has been so often described and yet is only half believed by many observers because they have never seen it—the great king of the air pursuing his vassal at headlong speed, overhauling him high above the marsh or the water, and then, as the angry hawk releases his fish, swooping down like a meteor from the skies and seizing the fish in his claws as it drops earthward.

TURKEY VULTURES AND BLACK VULTURES

The eagle, because of his size and strength and the kingship that he exercises when he chooses to exert his power, is the finest of all the soaring birds of Curlew Town; but, next to the eagle and in some respects even more appealing to the eye, the wood ibis makes a picture in the heavens that no lover of wild life, seeing the bird for the first time, is likely to forget.

The ibises are found generally in flocks, sometimes of no more than five or six birds, but at other times in companies of fifty or sixty; and in summer, when the eagle is rarely observed, they are incomparably the most impressive sight that the high air affords. Beautiful soarers and apparently delighting in lofty altitudes, they are often seen sailing round and round at dizzy heights like a fleet of airplanes manœuvring amid the clouds; then, as they descend in wide spirals towards the earth, gradually this resemblance to an airplane armada is lost, and one sees them as a company of great, majestic, white birds with black-edged wings and tails, their long outstretched necks and legs giving them just the fantastic touch that the picture needs.

Seeing them thus—watching them soar above the marshes of Curlew Town, perhaps forty or fifty of them together, gliding round and round under the bright blue sky and the white summer clouds—I have sometimes wondered whether a journey of a thousand miles could show me a finer spectacle of bird life or one more eloquent of Nature's wildness and freedom.



WHEN DAWN COMES TO WATER IN KANSAS LORENE SQUIRE

"LIKE A NARROW RIBBON OF BLACK SILK THE SLIM BODY OF THE KING SNAKE WOUND AROUND AND AROUND THE RATTLER'S HUGE BULK"

THE DIAMONDBACK

The Lurking Menace of the Swamp

by Samuel Scoville, Jr.

Illustrated by Charles Livingston Bull

PATCHES of milk-and-wine lilies, pearl-white tinged with crimson, drifts of snowy violets, their petals pencilled with sepia, waves of wild-jessamine perfume, all told of the coming of spring to the Swamp. There, in the old days, fierce tribes of Indians had lurked among the hidden islands of the great marsh and taken dreadful toll of the dwellers who lived along its borders.

The red men have long been gone. Only names and mounds and terrible memories of them remain. Yet their islands are not unguarded. There, among the silent, shrouded cypresses, still lurk dwellers more dangerous than the Seminoles and fiercer than the painted warriors of the Creeks.

On a night in May, as the twilight burned itself out in one long flare of amber and gold, an ice-blue star rose over the Swamp, darting gleams of violet and ultramarine through the gray festoons of Spanish moss. It was Canopus, that star which led Mahomet out of the desert to conquer half a world and which shows in the spring on the horizon of our southernmost states. A little later the full moon wheeled above the rim of the world and before her radiance Canopus, Spica, and all the other stars of spring paled and dimmed as she shone like a great shield of burnished gold in mid-sky. As the moonlight illumined the dark places of the Swamp, from an island hidden in its depths came the snoring, booming bellow of a bull alligator. Fourteen feet long, of vast girth, with the menace of his dagger-like teeth and lashing tail, the great reptile seemed the unchallenged king of the place. Yet the real ruler of that island was another, silent and deadly as death itself.

That night he came out from a clump of dwarf palmettos under whose leaves he had lain coiled all through the long, hot hours of the day, an eight-foot rattlesnake, gray-green in color, his back marked with that chain of olive-colored diamonds bordered with yellow which have given his species its name.

Slowly the thick body, over a foot in circumference, moved along the ground in an unwavering line, leaving a deep print in the sand, straight as the track of a wheel. The glittering black eyes set in the wide, heart-shaped head had oval pupils, that hall-mark of

a venomous snake, while a dark band beneath each eye emphasized the terrible menace in their depths.

As the great serpent moved slowly forward, its forked tongue flickering in the air like a black flame, it looked the part which it plays among the serpents of the world. The king cobra of Asia, the black mamba of Africa, the bushmaster of South America, and the death-adder of Australia are all fatal and terrible snakes, yet none of them exceed in deadliness the diamond-back rattlesnake of North America and none of them equal the menace of its appearance.

Coiling itself in the broad pathway of white sand made by the woodcutters when they lumbered the island, the great snake lay there, the deadliest creature that southern moon ever shone upon. Even against that snowy background, it looked like a patch of withered bracken, so subtly did its coloring melt and fuse in the moonfire. Still as the sand itself on that windless night, yet the serpent was hunting its prey in the fatal way of its kind.

For a long time there was no sound beneath the stars. Then from across the water came the ghostly hoot of a great horned owl, hunting among the scattered islands of the Swamp. There was another silence broken at last by a dripping sound at the edge of the island as a marsh rabbit, which unlike other rabbits, is an expert swimmer, landed, having taken to the water to avoid the owl. Then came a series of tiny thuds as the brown bunny, convinced that it had outwitted the grim hunter, came hopping leisurely down the trail.

Although snakes do not hear in the ordinary sense of the word, yet the rattler was instantly conscious of the vibrations of the rabbit's feet and its coiled body became tense as a steel spring. As the rabbit passed the blur of brown among the green fans of the dwarf palmettos there was a flash of motion against the sand, too swift for any human eye to register, and the rattlesnake was back in coil again as if nothing had occurred. Yet in that tiny tick of time a number of separate things had happened. The mouth of the great snake had gaped wide and the movable fangs of its upper jaw had flashed out of their sheaths of white gum like tiny spear-points. At the same instant the flat head had shot forward, burying the crooked white needles deep in the rabbit's side, while the muscles around the poison sacs contracted, spurting a jet of the pale-gold essence of death into the hollow fangs and from a hole in their side, like that in a hypodermic needle, deep into the veins of the little victim. There was a frightened squeal, a thrashing among the palmettos and then silence. Slowly the great snake uncoiled and with head held high and horrible, disappeared into the brush following the stricken animal's trail by scent.

"THE BROWN BUNNY CAME HOPPING LEISURELY DOWN THE TRAIL"

A few days later the rattlesnake again came out of cover and coiled itself in the very center of the trail, sinister and unafraid in the warm spring sunlight. A faint musky odor exhaled from its mottled body and at that scent of death all the wild-folk who had been accustomed to use that path turned aside long before they reached the sentinel who guarded it.

Toward noon the basking snake sensed the vibrations of a foot-fall with a certain slow arrogance to it as of one not accustomed to turn aside for any other dweller in the marsh. Then around a bend in the trail came a huge black beast with a splash of white in the center of its broad chest. The color, the humped hind-quarters and the head swinging low on a long neck could belong to none other than that wise and incredibly powerful king of all the carnivora of Eastern America, the black bear.

As his soundless feet came nearer and nearer to the silent shape on the sand, a clicking whir broke the drowsy, noon-tide silence sharp and sudden as an electric bell and the nineteen rattles of the great snake thrust

straight up beside its flat, waiting head, moved so rapidly that they showed only as a blur within its coils. Even before he caught the sound, the bear's keen nostrils had told him who it was that guarded the trail before him. For a moment the black beast faced the brown snake, his body swaying indecisively in the sunlight. Then suddenly he turned aside and making a wide detour around the threatening figure, picked up the trail farther on and disappeared in the brush.

For fully five minutes after the bear had gone on, the whir of the snake's rattles sounded as if controlled by some automatic mechanism which had to run down before it could stop.

It was that protracted rattling which was the great snake's undoing, for the long-continued, insistent sound brought to the spot the one creature in the half-thousand square miles of that marsh who did not fear and avoid the diamonded reptile whose body lay across the trail.

As the alarm-notes of the rattlesnake died away to a few scattered ticks, from the underbrush beside the path flowed a snake whose black body, cross-barred with chains of white rings, was much longer although slimmer than that of the other. The scales of the newcomer, moreover, were smooth instead of being ridged as were those of the rattlesnake, and its lithe body slipped over the sand with a speed which no diamondback, the heaviest of all venomous snakes, could ever equal.

Slithering through the sand, the shimmering black figure approached the coiled rattler unconcernedly, for the newcomer was none other than one of the king snakes, whose blood is immune to the venom of any reptile of the Western Hemisphere be it rattlesnake, moccasin, bushmaster, or fer-de-lance.

As by scent the diamondback sensed the approach of the other, its rattles again whirred warningly and the fixed, lidless eyes took on that look of terrible menace which neither man nor beast can endure to face.

The king snake, however, showed no fear, but shot straight towards the heart-shaped head which waited for him. Then like the sudden flicker of light upon water the rattler struck, driving its curved fangs deep into the back of the other and was instantly back again in position. The next instant there was a writhing tangle of coils in the path and like a narrow ribbon of black silk the slim body of the king snake wound around and around the rattler's huge bulk. Again and again the diamondback drove its fangs into the other's body. A man would have died in a few minutes and any small animal and most snakes almost instantly from such a tremendous dosage of venom. Its only effect upon the king snake, however, was the winding more closely of its relentless length, while its taut body and prismatic belly gleamed in the sun like burnished metal. Then the choking coils tightened and the rattler's mouth gaped open as it gasped for air. Not until the bloated body lay limp and lifeless on the sand did the king snake unloose its grip and disappear in the brush, the avenger of a long line of little victims who had fallen prey to that dead ruler of the dark places of the marsh.

THE PEKINGESE

Most Lovable of Dogs

by Josephine Z. Rine

MANY hundred years ago, the Pekingese was the sacred dog of the Imperial Palace at Peking where it was carefully guarded against all contact with the common people and bred with legs bowed lest it wander outside the palace grounds. Attendants who had charge of these hardy little dogs suffered death at their loss or misfortune. About 1860, after the treaty following difficulties with the English and French, some of the dogs were taken to England, thence to America, where they straightway became popular.

The Pekingese is the most lovable even if the most perverse of all toy dogs. He is typically Chinese in temperament,—courteous, stubborn, loyal, and offering friendship only after due deliberation. You can rarely make friends with a Pekingese unless this self important little tyke has first decided to make friends with you. He fights upon the slightest provocation and is as quickly appeased. He is bold and self reliant, and on his snub-nosed, wrinkled face is a perpetual sneer, comical in one so small. He must not be sweet; there must lie a lurking devil in his eye which quickly strikes a spark to the smouldering fire within that flames into a real, if very tiny, wrath.

The Pekingese is broad but wedge shaped, heavy in front and tapering in body after the fashion of a lion. His features are big and boldly cast, his body is swung low and he moves with the rolling gait of the pacer. His coarse coat stands off as if wind-blown, and his tail turns up closely over the back, sending its flowing plume gracefully to one side. In color, he may be red, fawn or sable, or he may be plentifully marked with white.

COURTESY, NATIONAL ZOOLOGICAL PARK

WHERE LIFE FLOWS CALMLY ALONG

The forest is forgotten, and the struggle for food. This mother has borne twenty-three cubs in captivity

WHY *is a* ZOO?

Concerning the Place of Caged Animals in Society

by Stephen Haweis

Mr. Haweis,—artist, author, traveler and philosopher,—has been a frequent contributor to the pages of NATURE MAGAZINE. *A number of his stories were based on the Smithsonian-Chrysler Expedition to Africa in the interests of the National Zoological Park. In this article Mr. Haweis discusses his view of Zoos and their value and significance.*

SOME bright boy visited the Philadelphia Zoo recently with a sling-shot in his little pocket. Lethal weapons of all sorts are proscribed, of course, but it is not possible to inspect every visitor. The "sporting" instinct was strong in that child and he selected the hyacynthine macaw for his target; it was found dead in its cage. The Society lost a very rare bird, worth about three hundred dollars, and the playful child went home without detection.

Another fiend succeeded in crushing the bill of the shoe-bill stork with a stone. The shoe-bill is probably the rarest bird in the world and the Bronx Zoological Society was not at all pleased about it. This stork is only obtainable from certain swamps in the Upper Soudan and is worth a thousand dollars on its native heath, and probably five times that sum alive in New York.

These vandals were ignorant and malicious, but the National Zoological Park lost a valuable monkey one day because a tender-hearted visitor felt impelled to bring in some poisonous leaves from the gardens with which to gladden the hearts of the poor prisoners. Of course he also selected the rarest and most costly animal in the collection for his benevolence. It died, for the popular notion that no monkey will eat anything poisonous is just as false as most popular notions on every subject.

There is a fine African elephant in the Zoo at Honolulu which has a somewhat bad reputation. When his keeper went away nobody could approach him, they say, except the keeper's little daughter. Some elephants are "rogues" and there is nothing to be done about it, but excuse can be made for the Hawaiian pachyderm since it was discovered that a soldier-boy from the barracks was amusing himself by feeding it peanuts in which he had concealed pins. A great joke, no doubt, if one is sufficiently low down in the animal scale to appreciate it. Such stories might be multiplied indefinitely. Every Zoo and circus man has seen things done to his pets which make him long to do murder.

Then what is a Zoo for, if it is not to amuse puerile minds bent on destruction? It is continually referred to as educational, but in what way does it educate anybody? What does the scientist learn from the Zoo, and

INTERNATIONAL

"JUST WAIT UNTIL WE GROW UP"

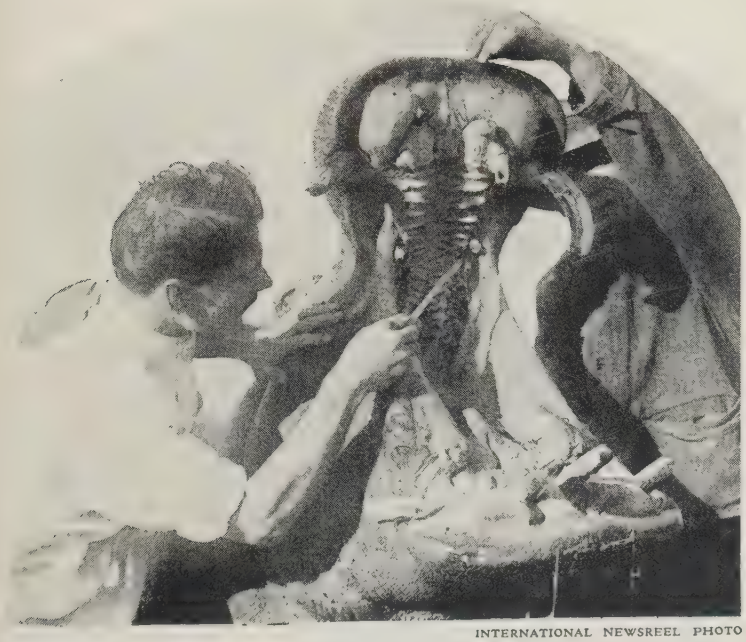
A basket of lion cubs, born in the Zoological Gardens at Blackpool, England. The forest will always be a myth to them

TRAPPED

Caught for a Zoo! King Leo rages and grows ashamed at his unwariness

what can the public, yearning for education, get out of seeing a lot of animals in cages? The public, whether malicious or benevolent, is preposterously ignorant about animals, and seems to cling to a vague idea that Zoos are places where animals are kept to divert children and furnish amusement to adults; it has not the remotest conception of what zoological collections are for. Thousands of people visit every Zoo in the country every year and the U. S. National Zoological Park at Washington has entertained over two million visitors in a single year. It is maintained by appropriations from Congress, under the general supervision of the Smithsonian Institution, and its director is a scientist of international repute. The recreational merits of the Zoo are not to be underrated, but if the U. S. Zoo were maintained for no better reason than to give enjoyment, a good circus showman would be found in the Administration building, not a highly trained scientist seeking additional knowledge.

Science gains by learning something about the life-habits of the creatures which inhabit the world. Those who keep animals are at least obliged to find out what they eat. They wish to know how long each kind of animal lives, its breeding habits, its diseases and parasites, knowledge which may have very far-reaching effects upon human life though a layman may not immediately see the connection. It was important to discover, for example, that the rat's fleas cause bubonic plague. By studying animals in captivity, as they never could be studied in the wild state, we learn what kinds can be kept in captivity and how they react to some of the artificial conditions we are obliged to supply for them. The Zoos of a country are official leaders in the science of pet-keeping. They supply information to all and sundry about domestic pets concerning which the average veterinary knows little or nothing. They inform anxious enquirers that insect-feeding creatures cannot live on bread crumbs and that a banana is not a food-substitute to a carnivorous bird.



INTERNATIONAL NEWSREEL PHOTO

"OPEN! NOW THIS WILL HURT . . ."

Hippo has the molar treated, which would never happen to him in the wild. There are advantages to Zoo life

And pet-keeping is of great importance to a nation though its value as a character-builder is only now beginning to be appreciated by educators. It must have been noticed that men who take an intelligent interest in Nature, especially in living animals, become gentle men. All the great naturalists have been conspicuously sympathetic and amiable souls in private life. Nature study cultivates perception and results in understanding; a general sympathy is the natural product of this kind of interest. It has been observed that very few criminals have ever been pet-keepers during their childhood; criminals are not made that way. The keeping of any small animal as a pet develops in the owner the very qualities which we desire in a citizen, cleanliness, regularity, responsibility, sympathy and love for those dependent upon him. The child who has learned to make a home for a little animal learns all the essentials of home-building, and it is worth a great deal to

H. ARMSTRONG ROBERTS

WHAT! UNHAPPY IN CAPTIVITY?

It is to laugh, and so does this seal, who has forgotten all about northern waters

a country which deplores the existence of a crime wave to have any constructive machinery at all which tends to develop the type of citizens it prefers; citizens who will not be apt to disrupt the peace of their neighbors and become at last a public charge in the nation's jails. This is perhaps the greatest value of a Zoo, considered from a national standpoint. It stands for the proper understanding and the best possible conditions for animals as well as for the instruction and possible education of the people whose one idea at present on seeing anything alive is that it is dangerous, probably poisonous and to be ruthlessly slaughtered on general principles.

There are many people who take an intelligent interest in animals who, however, are still not friends of the Zoo. Out in the woods, in God's sunlight, they say with pride, is where they study Nature, and they generally pursue small birds with field glasses and write down in notebooks where they saw the bald-headed bunting and the single-breasted tuft-warbler. A careful observer can see a great deal like this, no doubt, and it keeps him out in the open air, but there is an infinity of creatures which he cannot study because he never sees them; he can only see them in a Zoo unless he is extremely fortunate. Many of the nocturnal animals make delightful pets because they wake up just as the time most people have time to enjoy them.

The Zoo teaches people where to look and what to look for. The Nature lover knows this, of course, but sometimes in his enthusiasm for creatures in their wild state he comes to regard Zoos as prisons in which innocent animals are made to suffer a living death. He considers cages cruel and sees sorrow where, in fact, there is less of it than anywhere one can think of. The psychology of the cage has not been studied very deeply, but anybody who has kept animals in cages and has watched them day by day and year by year knows that they are not unhappy. Animals that are unhappy die. Like simple people their reactions are simple and direct. Those which are able to adapt themselves to artificial conditions,—the more intelligent individuals probably, as among ourselves,—soon begin to like their bars and in a very short time learn to run back to them for protection; their cage has become their home. When escaped animals do not come back it is probably because the world outside bewilders and frightens them so that they cannot find their way.

The life of a properly kept Zoo animal might be more justly compared with that in a hotel rather than in a prison. Everything is done for their comfort and well being, and the animals soon learn to regard the keeper as their friend. He pulls the thorn and trims the ingrowing claw, he separates combatants and attends to wounds and sores. It does not take a specialist to detect

FLIRTATIONS AT THE ZOO

Anyhow, the young lioness is much interested in what her friend has to say in her ear

WHO ARE ALL THE PEOPLE?

A bonnet monkey surveys her visitors, probably much amused with them

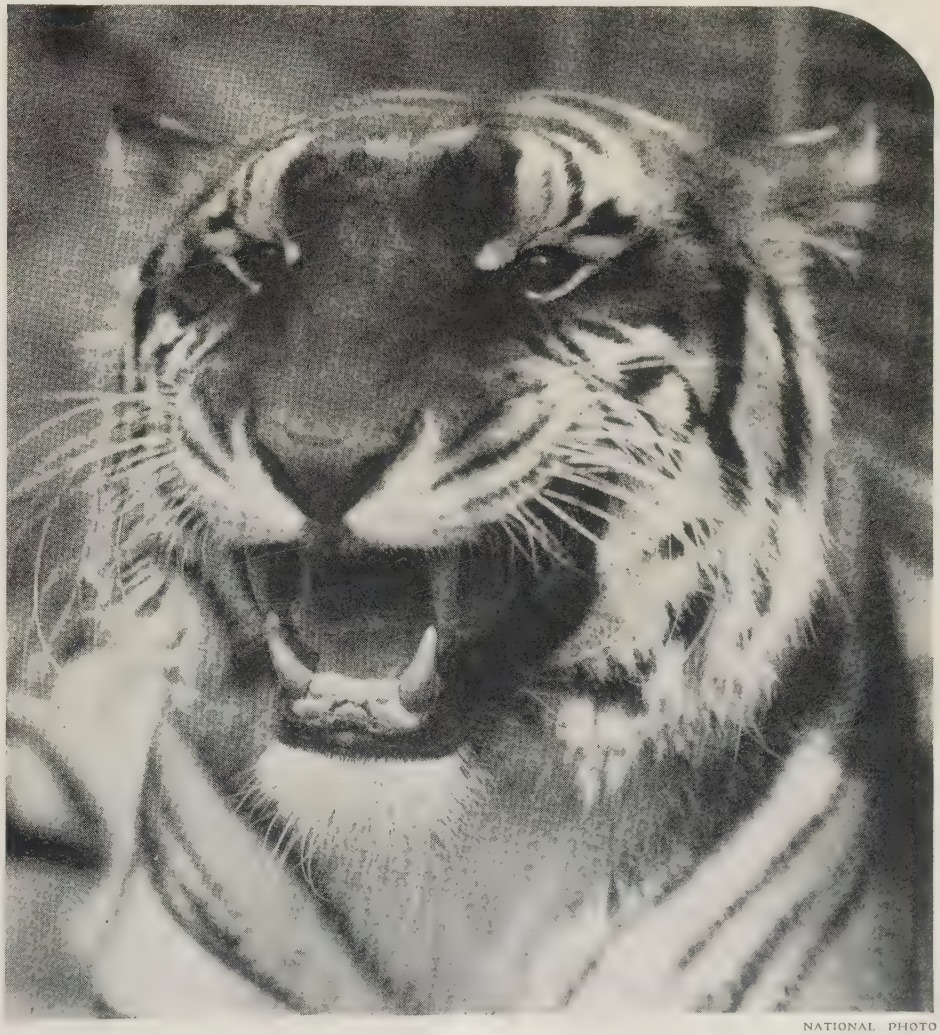
UNDERWOOD AND UNDERWOOD

when an animal is pleased, or angry, or sad. Anybody who knows them, knows at once. The animals treat casual visitors with complete indifference when the novelty has worn off, an indifference the average visitor merits, and it galls our pride to feel it. That is why the visitor tries so hard to make the animal notice him, but the most unfriendly animal in a Zoo is generally on friendly terms with the man who looks after him. The stranger may throw his peanut or wave his cap, but his name is mud, and he knows it.

Like the farmer, the caged animal "sometimes sets and thinks, and sometimes just sets." More often than not it just sits with nothing more in its head than a salesman in a country hotel window-seat. The essentials are being provided. It need take no thought about hunting for food, which is the chief animal preoccupation in the wild state, and it has no fear of sudden death from any of its natural enemies. I am one of those who believe that animals can think, quickly and well, about matters which they understand, but their scope is limited, like that of many human beings who are too lazy to do their own thinking, and beyond the needs of the moment they have neither obligation nor inclination to go. Most wild animals live through their noses and in the strictly immediate present. They do not sit and moon about what might have happened, nor even about the forest when they can no longer see nor smell it.

The apparent savagery of a new arrival in the Zoo is probably the expression of distaste for the unpleasant human odor to which it has not yet become accustomed, for it is reasonable to suppose that the odor of man to a beast is just as disagreeable as the odor of beast to a man; more so, because man has lost a great deal of his pristine olfactory sense. No self-respecting carnivore will kill man for food while it is active enough to catch some decent meat. The man-eater is generally long past his prime.

It is a thrilling experience to see a fresh-caught lion or leopard in a trap for the first time. Its rage is beautiful and terrible but the first emotion of a trapped animal is not fear. The big cats are not much afraid of anything though where they are much hunted they soon learn to fear a white man with a gun. The first emotion is shame; shame at having been outwitted, shame to be in the power of what it considers an inferior, evil-smelling animal, and its desire is all for fight and revenge. Fear comes later. Once it realizes that escape is impossible there are no doubt hours and days of fear. Its natural idea must be that it will starve to death, for since it cannot get out, how can food get in? But food comes,—a little, but enough. But will the miracle happen again? Little by little the creature comes to understand that starvation is not to



"WOONT HE LIKE TO GET AT YER?"

"He woont". He's probably angry at his mate, or waiting for his keeper with food

NATIONAL PHOTO

be its portion and it becomes quieter and more tractable unless it is teased by foolish visitors. The trap should be kept covered for several days and the animal kept as quiet as possible. With reasonable care an animal can be taught to do tricks almost as soon as it is out of sight of the forest.

Presently cubs are born, and the animal accustoms itself to seeing a procession of visitors and hearing one after another say, "Woont he like to get at yer?" He "woont", of course. The Zoo animal is probably just as glad of the bars as the visitors; they are his protection from many small annoyances. What passes before them is his diversion, and nobody who has kept a dog can fail to have observed that animals are diverted by the moving procession which passes a door or window. He cannot see the forest and thinks about it very little. It is animal nature to live in the moment and most animals are happy enough when they are well fed and watered and kept scrupulously clean. Sometimes he walks to and fro for exercise or in anticipation of food. Sentimental souls become full of anguish about the monotony and his apparent yearning to get out. It is no more monotonous for the beast than the routine walk to the office or train is to a man, and from the way some kinds of animals behave, it is not impossible that the monotony itself becomes a kind of game. A bear will often repeat step by step and every gesture again and again in exactly the same way. Rhythms, like sounds and numbers, are a source of interest and pleasure; it is the instinct of the dance.

Liberty, unaccompanied by an income and a technique for living, is not an unmixed blessing for human beings. Animals no less are obliged to have the means to enjoy the blessing of freedom. Every parent animal teaches its young what and when to eat, how to find and catch food, and what dangers are to be avoided. The wild-bred pheasant is twice as hard to shoot as those raised from the egg beneath a barndoor fowl. It knows how to take cover and has learned the technique of its life. How should the farm-bred pheasant know that a man will shoot it when it has been fed daily by a man since its chickhood? It has never seen a mink or a weasel or a hawk; it probably never does see more than one. Most of the pheasants turned loose in this way every year are killed in their first season. Even the wild-bred animal which has been kept for years in a cage forgets how to provide for itself and feels, I imagine, like a poor man after a prolonged visit to a rich uncle. It has much to relearn if it is to survive. Life in the wild is not so easy; there is severe competition, and when death is the price of the neighbor's dinner and life is for the spryest, there is inducement enough to be quick to notice things, and light on your feet.

Nature is not kind, and while it is pleasant for the lady with the field-glasses to observe the dickey-birds fly and hear them sing, she prefers not to think of the unsentimental, unmusical owl or hawk which regards the loveliest of bluebirds or orioles only as so much meat. Most little animals when caught expect death, and natural death for very many small things consists in being slowly torn in pieces and eaten alive. The dead are the lucky ones; the eater is quite indifferent so long as dinner holds sufficiently still to be eaten. You may see the falcon with a mangled bird in its upraised claw stop and listen for danger signals while the victim writhes and struggles; the falcon has no more thought about inflicting torture than a man with a plate of blue-points on the half-shell. This is one of the pleasures of freedom which does not occur in captivity, with the result that many creatures live far longer in the Zoo than they would anywhere else.

Of course, some escaped animals do very well, but it is never kindness to release a canary any more than it would be kindness to turn a pug dog free in a forest. These and many others are artificial animals whose natural home is a cage or cushioned basket. Many generations of idle rich ancestors have made them incapable of earning their own living in competition with wild animals.

A little knowledge of the nature of animals is not a dangerous thing. It may not seem very important, but it is astonishing how far-reaching even a slight understanding of natural history may be. It alters the whole point of view and destroys horizons; it directs a general interest into special fields in which the wise gather wisdom. Zoological collections stand at the gate of a new world for most people. The caged animal is a hostage from the wild with a mute plea for better understanding and increased, intelligent sympathy. The Zoo is his home. It should be used and regarded as an institution of the highest scientific and social value and significance,—and what's more, it amuses the baby, too!

With another season ushered in by October, Nature Magazine aspires to still higher levels of attractiveness and interest, and offers next month a varied, valuable series of articles. Late President Roosevelt, bird lover and Nature student, furnishes the theme of the lead article, which T. Gilbert Pearson has written on the famous Breton Island Bird Reservation, established by the executive-naturalist's order twenty-five years ago, and visited by him on numerous camping trips. Vernon Bailey, field naturalist for the Biological Survey, is the subject for a charming biography by Alma Chesnut, who pictures most humanly the man who knows three hundred species of gophers by their first names—and much more. Stephen Haweis has a good word on Hawaii's mynah bird; Will C. Barnes reveals the beauties of the Wichita National Forest; and Mrs. Dawson quaintly characterizes the rarely photographed limpkin. Paul Bonnot writes on the eared seals, and A. B. Champlain reveals the inner psychology of the hellbender. These,—combined with S. H. Derickson's "Gem of the Night", an insect story; Charles E. Baker's account of foxgloves; and the extraordinary pictures taken by Lewis W. Walker of burrowing owls,—make up an issue worthy of a place in the permanent files.

"SHE RUSHED AT US"
Unafraid, to protect her fledgling, who finally took to flight

JUST BEFORE FLIGHT
Below is the young plover about to initiate his new grown wings

THE PLOVERS

Shorebirds of the Prairie

by Lewis W. Walker

MANY think of the plovers as birds of the beach, or at least of large lakes or marshes. However, one species disregards this rule and lives instead in the arid cattle country of the West, where rattlesnakes, coyotes and horned larks abound.

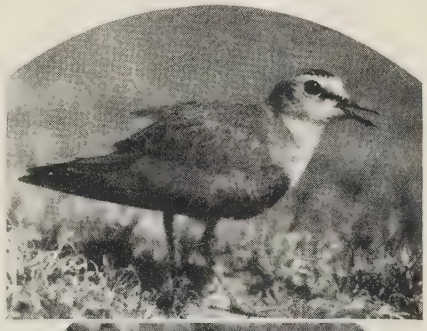
I first came across this bird while rounding up stock. We were interrupted in our task by a mountain plover, *Podasocys montanus*, fluttering on the ground as though in distress. The cattle, however, continued their uninterrupted course, and the plover had to resort to other tactics to ward them away from her nest. She soon found that flying in their faces was more effective, and showed extreme courage as she flapped her pointed wings vigorously at their eyes. The leaders of the cattle seemed to take this hint a little more to heart. They parted and a plot of ground a few yards across was left undisturbed, in the center of which was the bird's nest, containing three speckled eggs.

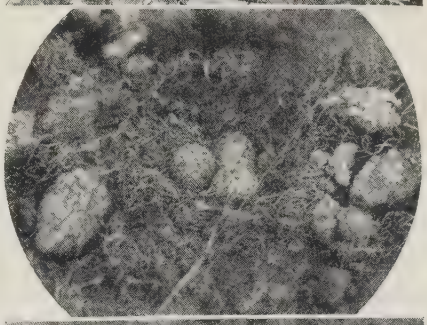
We returned later with a camera and while we were remarking on the protective coloration of the nest and eggs the bird returned and tried frantically to lure us away, feigning a broken wing. We followed to see how far she would lead us. After we had gone about fifty feet she miraculously recovered and flew off with joyous cries.

When we next visited the nest the same thing was tried again, but this time the bird was unsuccessful. We did not pretend to be deceived.

She then retired for several hundred feet and we were afraid she would not return again while we were present. She did, however, and this time with a great show of bravado. With spreading wings and tail dragging she rushed to within a foot of us. If we retreated she would follow, but if we advanced she would run. I placed my hand within six or seven inches of the eggs and she made a futile peck at me, and hit me with the end of one wing.

Afraid lest this show of courage would not last indefinitely, we retired, and later built a small blind near the spot. One interesting thing we noticed was the old bird's method of quenching her thirst. After she had shaded the eggs for an hour or so, she would slide off and walk to the nearest cactus, probe her bill in the soft, juicy pulp several times, and then commence brooding again.





(Top) JUST OFF HER NEST
The mother goes for a drink of thirst-relieving cactus pulp

A week or so later, we again encountered the courageous little bird trying to lure us away. We retired for several hundred yards and watched. She was soon joined by two round bits of yellow down, apparently walking on long toothpicks. As soon as we moved, the two young squatted and harmonized so well with the prairie that only one young plover could be found after a careful search.

We photographed him with difficulty, because he soon took to his heels, with the encouragement of the parent bird. We watched the young closely during the next few weeks, and just before they learned to fly, photographed them,—but soon mother and babies were gone.

(Center) THREE SPECKLED EGGS
Below, the broken wing trick is demonstrated for our benefit

The Black Widow

A COMMON CREATURE OF THE SPIDER WORLD LONG CONSIDERED DANGEROUS TO MAN

RARELY HOWEVER, CAN IT BE PROVOKED TO BITE, AND ITS EFFECT IS NOT FATAL

BY W. J. BAERG, UNIVERSITY OF ARKANSAS

THE black widow, in medicine and other sciences commonly known by its technical name, *Latrodectus mactans,* is a black spider, about half an inch in length. On the under side of the abdomen is a red spot, shaped like an hour-glass. The front and hind legs are relatively long and slender.

In the western hemisphere it is perhaps more widely known than any other spider. It occurs more or less commonly from New Hampshire to Patagonia. Although nowhere very abundant, it is over most of its range fairly common, and bears one or more common names wherever it occurs. In the United States it has in addition to the name given above that of the hour-glass spider. The Mexicans call it *Araña capulina,* for the reason that the body of the spider has the appearance of a small cherry. Chintatlahua is another name commonly applied to it by the Indians of Mexico. Farther south, in Central and South America, it is known by various names such as Cassampulga, Pallu, and others. In Peru it is called Lucacha.

Elsewhere in the world the black widow is represented by immediate relatives. In southern France, Italy, and other Mediterranean countries, this is known as the Malmignatte; in southern Russia and the regions adjoining the Black and Caspian Seas, as Kara-Kurt, meaning Black Wolf, and in New Zealand as Katipo.

During the spring, summer and fall, the black widow spiders may be found most commonly under stones and logs. They occur also in outhouses and other buildings. During a prolonged drouth they are found in or near dry stream beds. At such a time they commonly enter basements of houses where it is damp.

In June and July, the female spiders spin a number of cocoons, perhaps three or four, each of which will contain about 300 eggs. The young hatch in a few weeks, and soon after emerging from the cocoon begin to feed on small insects, or spiders, including their own kind. Some of these young attain adult size before winter sets in; others winter in the partly grown condition. The females that laid the eggs live on through the fall and under favorable conditions through a part of the winter. They are easily kept in captivity by providing a little water every few days, and supplying some flies or small grasshoppers for food about twice a week.

The reputation of the black widow and its near relatives varies in different parts of the world. In the United States physicians have long regarded it as dangerous, while some arachnologists have considered it about as innocent as other spiders. According to popular opinion, it is held as dangerous in some parts of the United States, for instance, Texas, as even the rattlesnake. However, it is not well known, and therefore other spiders are often regarded with as much fear as is the black widow.

Cases of poisoning by this spider have been reported from probably all the southern states, as well as the southwestern states. Occasionally the species becomes locally abundant and reports of spider bite are unusually frequent. During the fall of 1927, California, according to newspaper reports, had an instance of this.

Cases of spider bite are fairly common in the United States if one would depend on the doctors' diagnoses. Many a practitioner, however, will resort to "spider

bite" in any case of local swelling and inflammation with more or less general disturbance. This failing is made use of by some insurance companies that issue health and accident policies which are so broad that they exclude practically everything that can happen to a person. The clause which supposedly pertains to spider bites is usually worded, "bites or stings of insects". It seems a bit surprising that the legal talent in these companies has not realized that spiders and insects are two different classes of animals, as far apart as man and fish. Thus it happens that the black widow is brought into courts of law from time to time.

In Mexico the black widow is generally regarded with indifference. Cases of alleged poisoning seem to be relatively rare. An ancient writer says of it: "The sting causes fatigue three or four days, though it does not kill. The extract of these spiders is used in medicine for many infirmities." The extract, prepared by grinding up the spiders in alcohol or in water, was recommended for various diseases and it was supposed to be especially potent in the case of typhoid fever. In some cases a patient would be given as many as seventy spiders in three doses. Another writer says: "Their sting is deadly; the Indians cure it with a bean of the same shape and size as the spider, half black and half white, which they grind and drink as a gruel."

The relative of the black widow, Malmignatte, commonly found in the countries bordering on the Mediterranean, is only about half as large as the black widow, but the effects of the poison are quite severe. On man they are said to be: frightful pains, general weakness, often partial paralysis. During the dog days the spiders sometimes appear in considerable numbers in France, so that regular epidemics of supposed spider poisoning occur. Their abundance in southern Italy and neighboring countries where they likewise may appear in unusually large numbers, has been associated with a large supply of grasshoppers which furnish food for the spiders. It is said that in olden times when the spiders would appear in unusually large numbers, the people would flee from the country in order to escape the bites of the dreaded Malmignatte. In Corsica cases of poisoning by this spider are treated with heat and by rubbing garlic over the seat of the bite.

TURNED ON HER BACK

Note the hour-glass figure, which is dark red in live specimens. Here she is three times natural size

The Russian relative, Kara-Kurt, is somewhat larger than the black widow. Its poison has, on man, apparently the same effect as that of our black widow, but its bite is reported to be rather highly fatal to cattle, horses, and camels.

As has already been said, the authorities were formerly far from an agreement regarding these effects, some students of spiders considering them as insignificant, while many doctors and medical entomologists regarded them as serious and possibly fatal. The latter opinion was based partly on cases reported by physicians, and partly on the results of experiments. In these the investigator had ground up dried specimens of the spider and prepared an extract that was injected into various experimental animals. In the reports of the cases the identity of the spider was almost always uncertain; the symptoms of the patients varied a great deal and were probably much modified by fear, apprehension, and incorrect care.

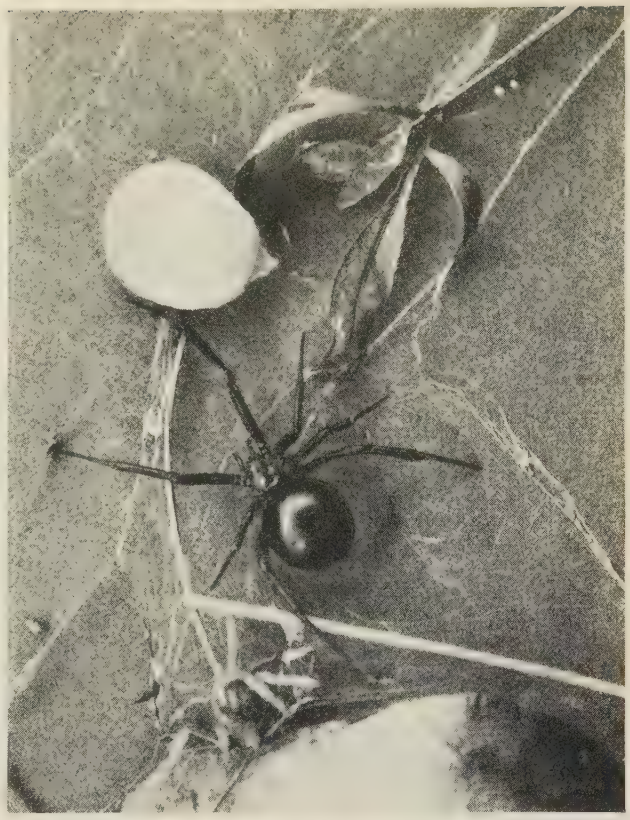
In order to determine definitely whether the black widow is relatively harmless, or decidedly poisonous, I undertook some experiments in which the spider was induced to bite first several white rats, and later me. In these experiments, the shyness of the spider presented the most serious difficulty. It is not very easy to hold without hurting it or making it uncomfortable, and it was only after many unsuccessful attempts that I learned how to induce it to bite. It was slow to anger.

THE BLACK WIDOWER

Or the male of the species, who is much smaller than the female, and only "among those present"

White rats about a month old showed a decided response to the bite of the black widow. They appeared ill, humped up with the head turned underneath till the face rested on the floor of the cage, they walked unsteadily, and sudden seemingly involuntary movements indicated mild convulsions. The test on rats was made a number of times, and the effects varied rather widely; in some cases the response was relatively slight, and lasted but for a short time. In the severest cases, the effects lasted from six to ten hours. In no case did a rat die.

From these observations, I judged that those arachnologists who regarded it as innocent were probably right, and that on man the spider would produce only mild effects. Therefore, when I at last succeeded in inducing it to bite me (on the basal joint of the third finger of the left hand), I allowed it to "hold on" for several seconds.

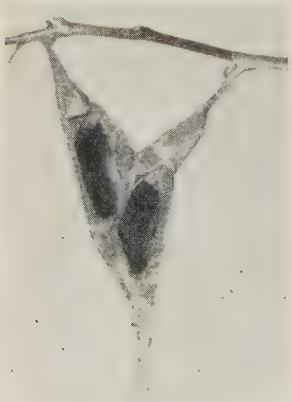


A TOUCH OF FAMILY LIFE
The widow and the cocoon, taken one and a half times the natural size

Almost immediately there was a sharp pain in the finger, and in twenty minutes it had extended to the shoulder. In a little more than two hours there was considerable pain in the chest and in the hips, and five hours after the bite took place, breathing and talking seemed to meet with some difficulty. Apparently the diaphragm was slightly affected. By this time the pain had spread to the knees and it soon extended to the toes. The pain was a sort of an aching sensation all over the body; in the hand that was bitten the pain was much sharper. There was only moderate swelling in the hand. Accompanying these symptoms there was a low fever (between 99 and 100° F.), and this state of affairs lasted for about three days.

Of the various remedies that were applied, only bathing in hot water had any appreciable effect. On learning this, I spent a good deal of time at it and thus spared myself quite a lot of pain.

Taking a general view of my experiences with the black widow, it may be said that although somewhat unpleasant, it had more than enough adventure in it to make up for this feature. It was possible to get a reliable record of the symptoms caused by the poison, and to determine accurately that the bite of the creature may have decidedly painful effects on man. It has not, so far as I know, ever caused death, and only under the greatest provocation can it be made to attack humans.



A BACK VIEW
Of the joined cocoons

CHANCE or INTENT?

Why the double Cocoon?

by Guy Bartlett

THE DOUBLE HOUSE
A most unusual event

IT is not unusual to find that caterpillars, when cramped into close quarters of captivity, will spin their cocoons so close to each other that they interfere and are interwoven, but it is out of the ordinary to find double cocoons in the case of caterpillars that are free to build their winter homes where they so desire.

Two Promethean caterpillars that grew up together on a lilac bush apparently decided, however, when the cool autumn nights arrived, that they would continue together through the winter—and so their cocoons were built jointly.

Or was it simply chance that led to the linking of their cocoons? Did one of the caterpillars think that the silk of its neighbor's cocoon was its own, and because of such a mistake fasten its own winter cradle to that of the other spinner to form this Nature oddity?

THE WIT of a RAT

by

Ben Hur Lampman

"THERE WAS A PRICE ON HIS SLEEK HEAD"

Illustrated by

R.Bruce Horsfall

THERE was a price on his sleek head. All the family, and we are five, had sworn that he must die. Chester the cat, with much twitching of whiskers, vowed he would show no mercy. Tam the collie gestured with slim head and flashing teeth, to illustrate how he would deal with him. He was proscribed. He was outlawed. The hand of every honest citizen was against him, as though he were Billy the Kid.

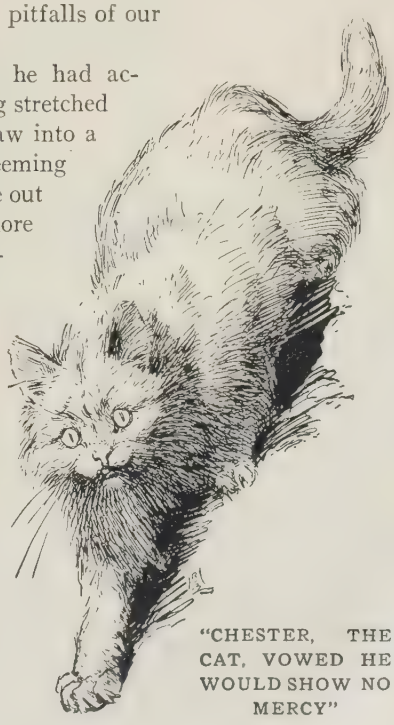
In his lawlessness there was something heroic. In his tenacity of residence there was the stubborn courage of the Boer. And in the beady eyes of him a mocking humor was resident. He was the last of the rats, the brown, fat Norway rats, to dwell beneath the feed-house floor, just north of the scratching shed.

By poison and trap we had brought him to this pass, where all his immediate kin were dead and done for. Of the gay, squealing, fighting, frolicking banditti that had tunneled beneath the feed-house, carried away a treasure of grain, slain the chicks of our red hens, and abducted the infant rabbits, only a grandsire was left. Only the ancient one, versed in villainy, and of a truly admirable wit, had eluded the snares and pitfalls of our ill-will.

It was told of Chester the cat that he had accounted for his quota, and that once, lying stretched beside the outer wall, he had thrust a paw into a tunnel, and—while we laughed at his seeming fatuity—had dragged a screaming captive out to doom. But the last rat of all was more than his match. Of patent poisons effective against ordinary rats, we had enough to win the approval of any Borgia. There were traps guaranteed to seize and to hold fast, and our collection of these lethal devices was considered to be the most complete in the neighborhood. Poison and trap had claimed a score of rodents, but for the grandfather of rats they were as thrice-told tales. He knew and scorned them, biscuit and steel.

The boldness of the evil one was amazing, and though he practiced discretion, it was as a fine art, for he was immune to fear. Perched upon the rim of the feed-bin, he would deride the cat that mewed and quivered only a short leap distant. The dreadful eagerness and desire of Chester, the half-blood Persian hunter, were his amusement. He knew to the briefest fraction of time the way of escape. He knew the length of the leap and of the instant, and his daredeviltry was in truth but the calmness of justified assurance. What happiness it must have given him to flout the enemy of rats, to leer into the whimpering maw, and yet to feel—by reason of his superior endowment—he was quite secure. If he mourned his relatives fallen in the war with man, and with man's allies, the futile fierceness of Chester was soothing to his sorrow.

It was June, and the chicks were fond absurdities of occasional flight and tail feathers, of commingled youth and approaching maturity. A cockerel had even been heard to undertake a crow, though scarcely was he higher than his sire's hock. They were of the Rhode Island breed, and therefore quite docile and confiding. The pity of their nightly plight seemed the greater for this amiability. And pitiable it was. Along toward evening, when shadows were slim in the garden, the fear of the rodent claimed each trembling juvenile. Custom and convenience urged the smaller chicks to the shelter of the hen's wings, and she no sooner spread these, with downy heads thrusting through the kindly feathers, than she arose restlessly and entered the yard again. The demeanor of the larger chicks, whose brood mothers had deserted them weeks before, was not less apprehensive and distraught. Timidly they approached those corners where it was their habit to sleep in close companionship, only to draw back affrightedly, and to talk in minor, startled chirpings.



"CHESTER, THE CAT, VOWED HE WOULD SHOW NO MERCY"

There was a presence in the murky shed—a pitiless presence from which they recoiled—a presence that walked by night. And

"TAM THE COLLIE GESTURED WITH FLASHING TEETH"

they shrank from it as they would shrink from the shadow of a wheeling hawk.

But as evening drew to a close, and dusk had the garden for its own, there was no choice. And hen and chicks, and the chicks that were third-grown, retired to await the lottery of doom. For he would come, that wise, cruel Norway rat, and he would choose as did the dragons of old days. He would come when the crickets were singing in the grass and the owl called "kitty-kitty-kitty" from the pear. Dire and ominous anticipation that never failed of proof, for nightly this grandfather rat came to the choosing. There was no Theseus of chickens to brave the monster and lay him low. Quite often the cries of the juveniles would awaken us in the house, or the futile protest of the hens would be heard. And thereafter silence.

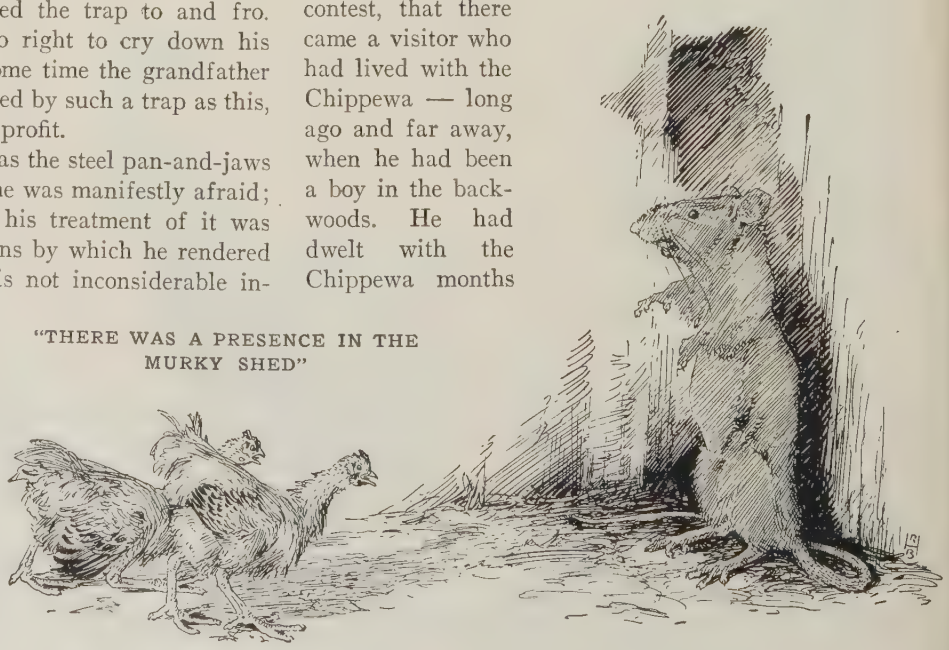
He had a way with traps that would have baffled a voyageur of the fur companies. He had two ways with traps. The wooden type, that bears its bait on a wooden trigger, and strikes with a bar of steel, he held in exceeding contempt. This trap he sprung whenever it was prepared for him, and having deprived it of power to harm he appropriated the morsel at his leisure. I am convinced he knew the perilous end of the device, and that he laid fast of the innocent extremity and worried the trap until its spring was tripped. For not so much as hair or whisker ever was found beneath the vicious steel, and in the dusty litter of the pen was evidence of his having dragged the trap to and fro. I assume, although I have no right to cry down his talent as a logician, that at some time the grandfather of rats had been shrewdly nipped by such a trap as this, and had turned experience to profit.

Of the second trap, which was the steel pan-and-jaws contrivance used by trappers, he was manifestly afraid; or, rather, I should say that his treatment of it was indicative of respect. The means by which he rendered it impotent were worthy of his not inconsiderable intelligence. The expedient of purifying the steel trap by fire, that no odor of man may cling to it, was of no avail, and but one conclusion remained to us—that he knew and recognized this trap not by scent alone, but by sight. And each time he dealt with it his method was the same. Of course, the exit from beneath the feed-house floor, whence he emerged to claim his nightly victim, was evident to us. The steel gin, grim and patient, was set where he must cross it if he would reach his prey. Yet there was no night on which he did not cross that deadly barrier and take, as his right, an accustomed toll of the flock.

And there were nights it seemed he ran amuck, or else his prey escaped him after wounding—which last is unlikely. Morning would reveal one or more chicks deeply bitten, and these invariably died within a few hours, their bodies swollen by the venom of his unclean teeth. It may here be remarked that many cats, who are not so finical as Chester the half-caste, and who eat such rats as they have killed, reject the head, as though an instinct taught them this portion, at least, is unwholesome.

His method was of the simplest, and yet it testified to a sagacity not unworthy of abler creatures, standing well forward in the ranks of comparative intelligence. It consisted of shoving before him—and I would I might have seen him as he worked—quantities of soil and litter, until these were between the open jaws of the trap and under the pan or trigger. The precision with which this project was carried out, the nicety of judgment, command an ungrudging respect, for at no time was the trap tripped by the clever rodent. As the litter and soil gradually became impacted beneath the pan and between the jaws, there no longer was an immediate danger of the trap closing. I think I see him as he brought the work to this stage, and paused to dart a meaningful glance at the huddled chicks in the corner. Having, in a manner of speaking, pulled the trap's fangs, he continued his labors and buried it in a heap of earthly materials—inches deep and harmless as though it were not there. This done he boldly crossed the causeway and chose his chick. And I am sure he danced the dance of the rejoicing craftsman, of the successful strategist, above the buried trap. For the heaped soil was smoothed and printed by a hundred stampings.

It was at this juncture, when we had all but abandoned the unequal contest, that there came a visitor who had lived with the Chippewa — long ago and far away, when he had been a boy in the backwoods. He had dwelt with the Chippewa months



"THERE WAS A PRESENCE IN THE MURKY SHED"

on end, and had gone out with their hunters. He had helped the squaws at the harvest of wild rice. He had talked with the Chippewa in their own tongue, and he knew how the mink is taken, and how the otter may be outwitted, and the ways of the muskrat, and the wisdom of the beaver. So long ago and far away that he sighed to think on it, and sometimes said that, had he his wish, he would be a lad again on the ice of a northern lake, spear poised above the fishing hole, as some vast pickerel moved like a great gray shadow toward the bone minnow. And trapping, he said, withheld few secrets from him, very few indeed.

"No rat," said he, with appropriate scorn, "can make a monkey of me."

He added quite casually, as it were evident even to stupid persons, that such gear as we owned would suffice for the trapping of a mere rat. The sharpness and prudence of rats had been excessively misrepresented by those who, lacking the lore of the Chippewa, the counsel of the red gods, made sorry work of a petty enterprise; such an enterprise, in fine, as a Chippewa lad of seven would not deign to undertake, as beneath his craft and cunning. Those who were lamentably ignorant of the ways of wild creatures, he said in effect, who had not trailed, tracked, trapped and hunted the wary furbearers of northern forests, might esteem the rat as difficult. Place in his hand the traps, or any trap, and morning would reveal the slain.

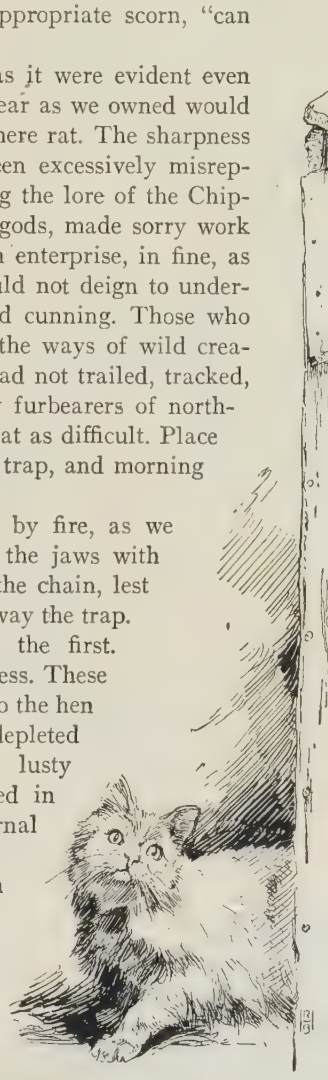
Well, he purified the trap by fire, as we had done. And he concealed the jaws with litter, as had we. He staked the chain, lest the captive rat should carry away the trap. We also had done this—at the first. Later it had seemed too pointless. These rites accomplished he turned to the hen in the corner, huddling her depleted family. Of fourteen lively, lusty chicks that once had drowsed in the shelter of that maternal bosom, only seven remained.

"Old lady," said the man who had been a boy with the Chippewa nation, "set your mind at rest. Everything's all right now."

In the morning—and, veteran though he was, he arose with sunrise to inspect the trap—there were but six chicks where seven had been at twilight. The artful mound was over the steel, and the scornful imprint of the rodent was on the mound. The trapper's face purpled slightly, but he retained a pose of seeming calmness.

"The other trap," he said. "I want the other sort of trap."

That night the grandfather of rats waltzed blithely with the other trap, and sprung it handily, as was his habit, and ate his bacon in peace, and slew a promising cockerel as well. And at high noon of the following day the rat was observed on the edge of the feed box, exchanging stare for stare with Chester the vigilant cat.



"PERCHED UPON THE RIM OF THE FEED BIN, HE WOULD DERIDE THE CAT"

The friend and inheritor of the Chippewa was distressed that he must make so short a visit. He said it would afford him deep personal pleasure to prove that no rat could make a monkey of him, and he regretted that other appointments forbade him this. He imparted to us a deal of expert advice, by the adoption of which we could not fail to end the dreary campaign and save our few remaining chicks. He vowed he was sorry to leave, but he appeared to be glad he was going. And we—well, we held the stricken field again.

Strategist and skulker—but warrior, too; a warrior refusing direct battle only for sufficient reasons, and these his warranted confidence in his own mentality. And what an heritage was his! Out of the heart of fecund Asia the black rats migrated to Europe, where no rats had been. They were personable rodents, those black rats—far less harmful and sinister than the outlaw who lurked beneath the feed-room floor, amid the plumage of the slain. But when the black rats had invested and occupied Europe, and were everywhere common, the heart of Asia spewed forth a second great migration of rodents—and these rats were brown. They came at first in a thin vanguard, but they gave relentless battle as they marched, and ever the horde increased. And such a war they waged as Scipio Africanus conducted against the Carthaginians, until at length the black rats were all but obliterated. Again on this continent, whither both species came with the first commerce, the racial conflict of brown against black had continued—but in time the brown rats held the land to tribute. Here and there, in odd, out-of-way nooks of the planet the black rats have their refuges—until the brown rats come upon them. The hoary rascal underneath the floor was the heir of such tradition. His fathers were historic. But we lingered not too long at these reflections.

"Tear up the floor!" I said, for there was naught else to do.

We wrenched and pried at the boards, and dust arose chockingly. His lanes of hidden travel were laid bare, the gnawed scantlings through which he passed from lane to lane, the nest in which he had slumbered at his dreams of evil. And as the boards were wrenched away, there was a sound of scurrying and a dust cloud we had not occasioned. Another board; now that one. It was here he had devoured the bantam, for there were golden hackles in the sifted chaff.

Chester the cat watched with wide eyes of topaz. Tam the collie was tense with excitement, and now and again rocked stiffly on his feet. Grimed and perspiring we ripped away the last board, and the quarry turned to face us—yellow teeth bared and eyes blazing. The cat sprang. The collie rushed. But a blow fell first. And so it was we slew the rat, and laid low the fatal presence.

ONCE THE HOME OF THE GRAYLING

Au Sable River, in the jack-pine plains, where they flashed and darted in abundance. Gone are the days . . . . .

Trout of The Pines

Michigan Grayling, Once King in Sparkling Streams

by Edward Allen Hyer

THERE was a mystery fish in Michigan back in the days when the great forests of white and Norway pines lifted their regal crests, as yet unshorn by the woodsman's axe; when the sky was darkened by flocks of passenger pigeons; when unknown to man and destined to remain undiscovered for more than fifty long years, Kirtland's warbler nested on those jack-pine plains which are still the only place in the world where it is known to nest.

As early as 1855 the residents of Grand Rapids, then but little more than a woodland village at the falls of the Grand River, knew that "a peculiar kind of trout" existed in certain tributaries of the Muskegon River to the north They did not know that about ten years earlier specimens from Lake Ontario had been sent abroad, and that Cuvier and Valenciennes had named the fish *Thymallus ontariensis*. Later Doctor Parker proposed the name *Thymallus michiganensis,* but this name was never published, and has no standing even as a synonym.

MOST COLORFUL

Olive brown on back and sides; rose, blue and purple on his fins. The Eskimo called him "wing-like"

A still later episode was somewhat dramatic. Picture Michigan in the summer of 1862. Our scene: the banks of the Michigan Jordan. Our script: from the files of the *Wildwood Magazine* of the '80's The curtain rises to reveal three sportsmen encamped in the columned solitude of the primitive, thick pines.

"Dr. Carpenter, as was his custom, was up with the sun; taking his line, he cut a switch from the undergrowth, and was soon fishing for breakfast for the company. He went to the creek, put on a grasshopper and began pulling in a mess of peculiar trout—a fish whose name at that time was unknown to him. Taking them up to the tent Dr. Carpenter and Mr. Clarke began dressing them ready for cooking, and Judge Martin at that moment sticking his head out of the tent, exclaimed:

" 'Hello, Clarke! Where did you get them? Why, they are grayling; Scotch grayling! No room for argument.'

" 'No, Martin! Seth Green claims there are no grayling in Michigan.'

" 'Well, I know better! I've caught hundreds of them in the streams in Scotland. By the bye, I have some ichthyological works here in my travelling case; let us examine.'

"He found the books, compared the structure, color, position of fins, spread out the dorsal fin, carefully counted the spines, examined the mouth for the position of the teeth, and finished his search with: 'Let your fish experts say what they please about there being no grayling in Michigan. These are grayling, sure as fate, only 'tis a handsomer fish than his English cousin.' "

ONCE SPARKLING WITH LIFE

The forests went; rainbow and brook trout came, and the grayling, lord of the land, passed away

There followed another scientific description in 1865 when Cope renamed the new game fish *Thymallus tricolor.* This name was current in fish literature for many years.

By the '70's the outdoor magazines were deep in controversy and accounts of it. Probably no game species became more quickly known than did this game fighter, whose discovery was a surprise to American naturalists. *Forest and Stream,* then a weekly journal, gave much space to the new game fish in 1873. Professor Agassiz wrote a letter on the grayling which appeared in the New York *Times,* other newspapers took up the matter, and soon the grayling was well-known,—too well-known!

As Michigan opened up and the staccato-voiced axe bit deeply into the majestic forests of pines, the Michigan grayling was found to occur in vast abundance in the tree-lined streams of this region. On the west coast of the Lower Peninsula the Muskegon, Manistee, Boardman, Boyne, and Jordan Rivers knew the scintillant flash of their fins. To the north and east they made rainbows where the Au Sable, Sturgeon, Cheboygan, Thunder Bay, and Rifle Rivers flowed in Lake Huron. They became known to the ardent fishermen who, in ever increasing numbers, sought them as "the trout of the pines."

In the year 1873 Prof. James F. Milner, then Assistant U. S. Fish Commissioner, in company with D. H. Fitzhugh of Bay City, Michigan, who had up to this time made known more facts concerning the habits of the grayling than anyone else, embarked on an expedition to the headwaters of the Au Sable River to study the habits of this fish. His report in part reads:

"In these days of extensive pioneering and wholesale exploration the man is favored who finds himself in the midst of a really untrodden wild. The character of the land and the timber in this locality have little attraction for the seeker after productive soil or investments, and the sportsman and the naturalist find here a patch of Nature left in almost primeval purity." He was speaking of the jack-pine plains of Kirtland's warbler fame, which today remain much as he saw them, except where fire has swept. "As we embarked in our light boats, in the early morning, and our bows broke the trailing mist that covered the river, it was as if brushing the fresh bloom from newly plucked fruit, so untouched by the hand of man did everything seem.

"Quietly the guides poled the boats down the rapid current, while we adjusted rods, lines, and leaders. . . . Dropping the flies at just the spots where trout would be sought for, finding the grayling similarly located. . . . Hooking a large one we had good evidence of his plucky qualities; the pliant rod bent as he struggled against the line, curling his body around columns of water that failed to sustain his grasp, and setting his great dorsal fin like an oar backing water, while we cautiously worked him in, his tender mouth requiring rather more careful handling than would be necessary for a trout . . . rallying for a dart under the boat, or beneath a log, as an attempt is made to place the landing net under him.

"They are free, strong biters, and cannot be considered very shy, as they will rise repeatedly to a fly. . . . Mr. Fitzhugh by skillful management landed three from one fortunate cast.

"There is no species sought for by anglers that surpass the grayling in beauty. They are more elegantly formed and more graceful than the trout, and their great dorsal fin is a superb mark of beauty. When the well-lids were lifted and the sun's rays admitted, lighting up the delicate olive-brown tints of the back and sides, the bluish-white of the abdomen, and the mingling of tints

of rose, pale blue, and purplish-pink on the fins, it displayed a combination of living colors that is equalled by no fish outside of the tropics. . . . It will probably be found to have the same habits as its European relatives, and spawn in the spring. It is adapted, like all the Salmonoids, to artificial culture. . . ."

Prof. Milner was right in saying that it would be found to spawn in the spring, but not so correct in his prediction that it would be amenable to artificial propagation. For repeated attempts under every conceivable condition have to this date resulted either in complete failure or in a success so temporary as to be negligible.

In the meantime, another species of the grayling had been discovered in 1860, in the headwaters of the Missouri by Surgeon J. H. Head, U. S. A., and was named *T. montana* by Milner in 1874. This is the Montana grayling of the present time.

The first species of grayling to be discovered in the western hemisphere was found by Captain John Franklin's expedition to the Arctic Ocean in 1819. This species inhabits the streams of the Mackenzie Basin, and was called *T. signifer* by Sir John Richardson. In the words of Sir John we have an account of its discovery. "This very beautiful fish abounds in the rocky streams that flow through the primitive country lying north of the sixty-second parallel of latitude between Mackenzie's River and the Welcome. Its highly appropriate Esquimau name 'Hewlook-Powak', denoting 'wing-like', alludes to its magnificent dorsal, and it was in reference to the same feature that I bestowed upon it the specific application of *signifer* or the 'Standard-bearer'."

The accounts of the former abundance of the grayling, like those of the passenger pigeon, are difficult to believe. Instances were frequent of their blocking waterways during their movements up-stream. There is a tale of two men who held their canoe across a Lower Peninsula stream at the foot of a waterfall and caught seven hundred grayling in a half day as the fish attempted to ascend the current.

Today the Michigan grayling is gone from the streams of the Lower Peninsula. From all accounts, the year of 1903 seems to have marked its passing. There is but one place where this fish is still found in its original habitat, and oddly enough it is in the northern peninsula and not the southern that it has survived. In six miles of the length of the Otter River in the north center of the Upper Peninsula near the Superior shore, grayling are still found. And those six miles constitute the only place in the Otter where they ever have been found.

The discovery of the grayling in the Otter dates back to 1884, and the largest fish of which there is record were taken from this, their northern habitat, where they attained a length of nineteen inches and sometimes a weight of four pounds. In the major part of their range in the Lower Peninsula of Michigan a length of sixteen inches was considered large, and a weight of two pounds was that of an excellent fish.

The State Fish Commission of Michigan has for over two score years attempted to propagate this species artificially, starting in 1885 when the desirability of the grayling as a game fish was being widely recognized. But this department, whose record with other species is excellent, and whose work today is insuring perpetual fishing in Michigan, has met with repeated failure with the grayling; nor has the success of other experimental agencies been more marked.

The planting of fry hatched from fertilized eggs removed from natural spawning beds caused no noticeable effect in the rapidly diminishing numbers of the grayling back in the '80's and '90's. Experiments in confining adult fish to portions of their native streams for study and to insure stocking supply resulted in their failure to spawn.

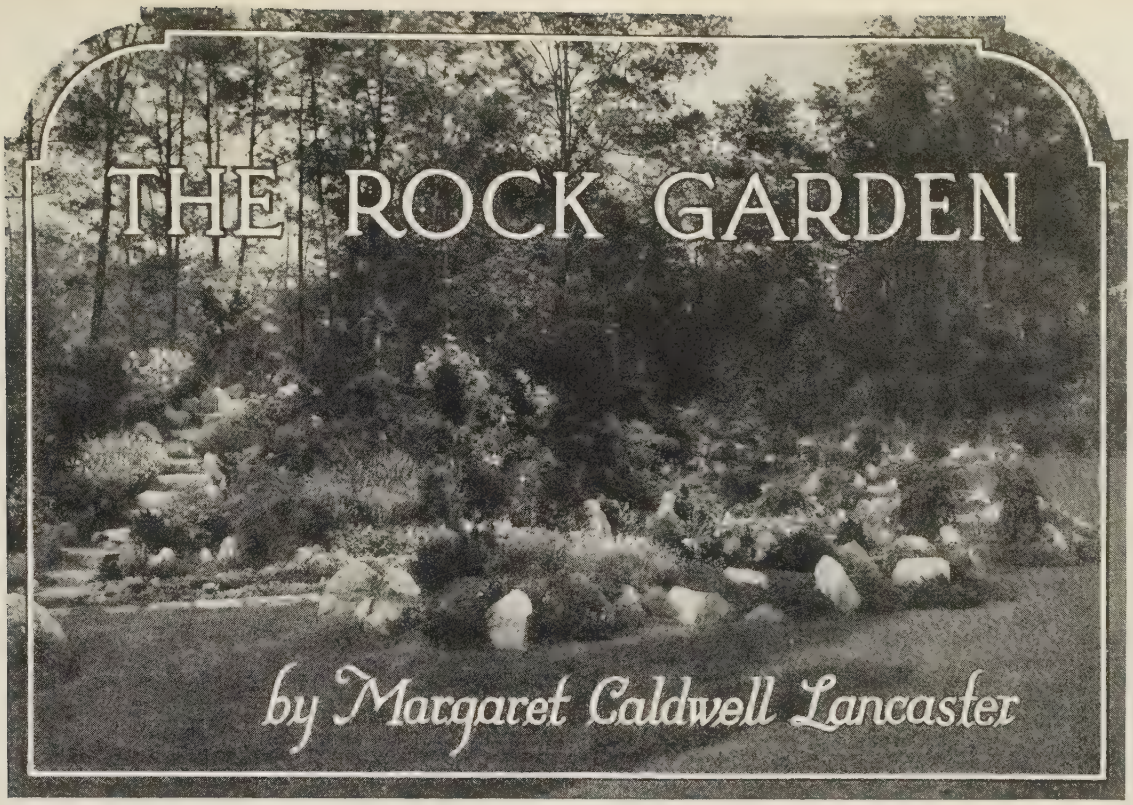
At last, in 1926 one hundred and thirty fish were taken from the Otter and the majority placed in a tributary of the Tittabawassee, a stream in which these fish were once plentiful. The same year one million fry of the Montana grayling, hatched from eggs received from the Montana Fish and Game Commission, were liberated in five of the Lower Peninsula river systems. The outcome of these two experiments rests for the future to disclose.

The why and wherefore of the passing of the grayling is still debatable. A diminution in numbers was noted by anglers during the years when the masses of timber were sent down the grayling streams, but later the grayling seemed to have temporarily regained some of their former abundance—this was before the introduction of the brook and rainbow trout to these streams.

Fred Mather in 1880 called attention to the dangers of introducing the brook trout into grayling streams. "The small mouth of the grayling and its exceedingly small teeth proclaim it a feeder upon insects and their larvae, and forbid it to prey in turn upon the young of their enemies, hence it would not appear proper to stock their streams with trout, which, hatching in December to February, are large enough in April to swallow the young grayling just out of the shell."

Whatever evidence may be considered in an attempt to solve the problem of the passing of the grayling from Michigan waters, these facts are clear. First their diminution was contemporary with the removing of a major part of the flora of their range, the white and Norway pine forests. It would be impossible to remove from any area so large a portion of its balanced whole as the forests without in some way affecting the welfare of countless other once-coordinated parts. It was accelerated by excessive fishing at all accessible points. And then the balance of Nature was further overthrown by the introduction in vast numbers of the brook, rainbow, and German brown trout; all excellent game fish but cannibalistic and predatory in the extreme. Their introduction into the range of a fish which hitherto had had practically no piscatorial enemies with which to contend seems to have determined effectively its fate.

The time is indeed at hand when,—unless we redouble our conservation efforts,—we shall agree with the Indians that the best hunting and fishing is in the "happy hunting-grounds" beyond the sunset's gold.



THE ROCK GARDEN

by Margaret Caldwell Lancaster

A ROCK garden is "a veritable vest-pocket world", for it may include sand-plains, windy heights, narrow ledges, a pool or bog land, a steep, rocky hillside, and woodland. If we love these things in Nature, we can, with ingenuity, reproduce them in miniature on our own places. Moreover, such a garden becomes the most intimate type of all—it truly reflects one's love of growing things and knowledge of the needs and environment of plant material. Planning for it should therefore be approached in quite a different frame of mind from that in which one starts out to construct a perennial bed or a shrubbery border.

Too often the existence of a rock garden seems to be the result of a misguided desire to have something "different", or more usually, it is given its location where one or more failures have proven that the place was not meant for perennials or annuals or a lawn. So, we think that if we acquire a few rocks of different sizes and shapes, order the usual collection of rock plants, place the stones just—here and there—using the plants to fill the bare spots, our worries about the beautification of that erstwhile barren section are over and a rock garden is established.

After all, however, such a personality reflector deserves a plan. The important points for consideration are the size and type of available space, the site and exposure, and the types of natural materials, such as rock and water, which are at hand. The size is determined, in proper proportion, by the area of your place, or more often, alas, by your pocketbook! Take warning! Be prepared to spend at the outset several times the amount you think ought to cover the cost, for this initial expenditure is always the greatest, and the subsequent upkeep is very slight. The site should be away from the house rather than immediately adjoining it, and given a setting of trees and shrubs. Here you may use a natural slope, planning for various elevations, different levels, terraces and paths, all of which it is well to include in your first ground-plan. Remember that such a garden is built for permanency. Do not achieve it too hastily!

Have you ever stopped to consider the purpose of

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A PAIR OF ACID-SOIL PLANTS

The mountain phlox and the heart-leaf, in the lower left corner, thrive together

HERE IS MOTTLED GINGER

Attractive in every sense of the word, and an acid lover. Ideal for the rock garden crannies

WILD FLOWER PRESERVATION SOCIETY

THE WELL-KNOWN MOSS PINK
No rock garden would be complete without this evergreen variety with its mat of bright pink flowers in Spring

rocks in a rock garden, and just how and where they should be placed? They serve simply as a means to an end; in short, to uphold a mass of soil and provide drainage and warmth in winter, and coolness and moisture in summer. When we recall the true alpines, wind-swept and sun-baked, they appear to live and get their sustenance from the surface of the bare rocks, but each one is rooted deeply in some crevice filled with soil, so that the rock serves as a flower-pot.

In placing the boulders, the essentials are to provide the assured depth of soil, proper drainage and, of course, to follow the garden plan. This will take into consideration the general slope, if any, the mounds or little hills, valleys or depressions, paths, steps, and the presence of water, if you are fortunate enough to have it on your place. Consider the possibility of some outstanding feature—a large boulder or sharp cliff—and build the garden up to it. A natural slope or two different ground levels afford perfectly plausible excuses for a rock garden. Possessing none of these, but only a perfectly, hopelessly flat space nevertheless, go ahead and use it to the best advantage if you feel that you just won't be happy without your heart's desire. Try to reproduce Nature's plan!

A fundamental secret of cultural success lies in the drainage provided for these little plants before the soil is mixed, or the rocks placed in position. Use bits of broken bricks, flowerpots, gravel or sand for drainage, and place a deep layer of this well under the level of the garden, the depth depending upon soil and location and material to be planted. For a level garden, the drains should be about four to eight inches deep; for a sunken garden, twelve inches. Sandy soil requires little underdrainage, but clay needs considerable, particularly if on the level; if on a steep slope, a shallow layer can be used with safety, if stone chips are provided for a ground cover.

THE VIOLET IRIS SHINES
It flowers in early May, demanding an acid soil

THE GRACEFUL STEPS
Adorned with Dianthus plumarius, *as dainty as can be*

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Next comes the choice of rocks. You may fortunately live where there is a generous outcropping of them on the place, or where you can easily obtain limestone or sandstone, which are the best for the purpose. If it has to be purchased, the more porous kind you get, the better, as this type conserves the moisture necessary for the plants. The lot should include rocks of varying shapes and sizes, from two to five feet across, but of one kind. In placing them, follow a natural plan. Bury the large rocks deeply and firmly, but occasionally allow a smaller one to rest on the surface, and be sure not to block up the crevices when putting them next to each other. The whole should have, as Nature does, an air of firmness and stability. Think of the rock as a support to the soil and to prevent its washing away. Do not let the upper rocks overhang the lower ones. It is essential to prepare pockets of soil between them large and deep enough to hold the plants.

The garden itself ought not to be near formal plantings, because it is the exact opposite of that type of landscape architecture, but, if it must come there, break

THE PASQUE FLOWER

Though a mountain grower, it is found in many gardens and is one of the most beautiful plants

KILROY HARRIS

the space with a short, informally planted path and at the entrance have large dense shrubs, like rhododendrons or some medium high conifers, to make a distinct markation and also give an air of privacy.

The consensus of opinion calls for full sun in the major part of the garden, the occasional shade being provided by shadows from the rocks or low shrubs. There are so many shade-demanding rock and alpine plants, however, that if one prefers, a shade garden, filled with these types, can be created.

HAVE YOU GOT THIS BLOOM?

It is Narcissus moschatus, *of the pseudo - narcissus group, and is one of the most charming of the flower*

To return to the needs of the sunny garden, let us consider the soil mixtures. You must provide for immediate surface drainage and also an abundant moisture supply. A suitable mixture includes: One part garden loam, free from clay; one part stone chips or gritty gravel; one part white sand, and one part granulated peat moss or leaf mold. For plants with special tastes, add either lime or more peat, as required. After a thorough mixing, fill the holes at least a foot deep with it. Remember that the plant-roots cling closely to the stones, so that the soil should be made firm to prevent air pockets from forming. March and September are good months in which to plant, although, with proper care, plants may be added at almost any time. True alpines protect themselves by keeping some seven-eighths under ground. As a type, they demand sun and lime, much drainage and a poor but porous soil; but a few need special materials and pockets of peat and rich earth. For the "temperamentals", use a mixture of six parts sand, one part leaf mold, and one part peat moss, adding lime if necessary. Mulch with stone chips to retard evaporation from soil in summer and, in winter, the rotting of the crowns. But when you bring these little strangers into your garden, try to find out their needs as to soil and moisture conditions, and whether they demand sun or shade, acid or alkaline conditions. Then build them a home after their own hearts.

What a joyous shopping trip, this one of buying plant material for your rock garden—scanning catalogs, consulting lists and borrowing and profiting from your friends' efforts! The rock garden should be devoted to the exclusive use of hardy plants of dwarf stature, which are truly mountaineers, or those requiring special soil conditions or locations, too individual to be grown in the hodge-podge of the usual border. Their character and "suitability" are their perquisites of admission.

Strictly speaking, an "alpine" is one growing above timber line on a mountain, used to being buried deep under snows and baked by blazing summer suns. Its roots, therefore, must go deep to find moisture—often it creeps for several feet

ITS HOME IS A MOUNTAIN SLOPE

The purple aster will add to certain types of landscaping

ASAHEL CURTIS

WILD FLOWER PRESERVATION SOCIETY

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TWO OF THE FAVORITES

Oconee-bells, at the left, and Sedum, a rosette plant, are veteran rock garden plants

through rock crevices—its stems are short—but two or three inches long—and its flowers large and brilliant amid foliage that is generally evergreen. Of course, in planting the bog, the pasture, or the desert of our miniature landscape, we must look for plants for those environments, and such types may well be included. Much of our native material can be used here. In a shaded, acid, damp corner may perhaps dwell our lovely trailing arbutus, pink moccasin flower and the trilliums.

It is advisable, first, to go over the entire garden-plan, taking notes of spaces which should be filled with low shrubs, ground covers, cluster and spreading plants, creeping plants—useful for covering banks—and rosette plants which are usually drought-resisting and therefore grow with a minimum of soil or between rocks.

As soon as the plants are ordered, study catalogs or some authoritative book for the necessities, jotting down this information beside the name of each plant in your garden book, so that, when they arrive, you will know what they want in soil and location and what they will look like when grown. Somewhere, under cover, there should be boxes containing a surplus supply of coarse sand, fine white sand, peat, leaf mold, crushed limestone or gravel, stone chips and some good loam. In early spring, it will be necessary to go over the entire garden, to top dress plants, fill in around exposed roots, and cover up ragged spots. A good top dressing includes one part sand, one part loam and two parts granulated peat moss. At this time, new plants or divisions of old ones may be set out. Seeds of annuals or biennials can be planted, such as *Gypsophila muralis, Asperula azurea* or *Linaria alpina* from the Swiss Alps.

Early May, August or September are satisfactory months in which to do the general dividing or transplanting. And do both well. Dig a hole, place a layer of stone chips in the bottom, fill partly with proper mixture of soil, then water, and finally fill up around the plant with soil, firming the top soil about its neck and mulching with stone chips. Don't forget to properly label your garden visitor with his name, date and, perhaps, his source. Through the summer and until frost, weed, weed and then weed some more, if you want your treasures to survive. Leave *not* this work to your hirelings! For a fall mulch, use salt hay, or, for large plants, leaves or peat, and do not be too hasty in removing this covering in the early spring lest you expose the blooms to an unexpected frost or the cold spring winds.

J. HORACE MCFARLAND CO.

THE BEAUTIFUL BLOOMS OF AZALEA

If you can add this shrub to your garden, you have achieved a triumph

The rock garden basket contains rather simple tools: a dibble, one large, and one long narrow trowel, one long, and one short kitchen steel fork, heavy shears for cutting plants, and lighter scissors for snipping off seeds and blossoms, hairpins for layering and pegging, a light brush or whisk broom, wooden labels, an indelible pencil, and little berry baskets for protecting newly set plants.

In the vicinity of New York and Washington, there are probably only two months of the year, December and January, when blooms of some sort are not generally seen in the rock garden. The enthusiast greets with joy the early crocuses in February and early March, and the brilliant winter aconite, *Eranthis hyemalis* and *E. cilicica;* the waxy white snowdrops, *Galanthus cilicicus, G. elwesii* and *G. nivalis;* the azure blue stars of *Chiono*

doxa, and the nodding *Leucojum vernum.* April and May bring us other bulbs,—the grape hyacinths, *Muscari azureum* and M. Heavenly Blue, that light up the garden for at least six weeks; the scillas, *Scilla campanulata,* blue and white, *Scilla nutans,* the English bluebells, and the charming early bloomer, *Scilla sibirica.* Tulips lend their gayety by numerous species,—*clusiana* (the lady tulip), and *greigi* are rather rare; *kaufmanniana* is yellow and rose; *praecox,* bronze; and there are the saucy yellow and bronze *persica* and fragrant *sylvestris.* Erythroniums, the dog-tooth violets, seem happy in the rock garden and many varieties are successfully grown, such as *Erythronium californicum, E. citrinum,* and *E. hendersonii.* And have you ever had the joy of seeing and smelling that delightfully fragrant little bulbous iris from Asia Minor, *Iris reticulata?*

A vast and interesting army of perennials, many of which can be grown successfully from seed, present themselves for selection. In order of bloom, through March and April, come several species of the primroses, *Primula denticulata, P. farinosa, P. veris, P. acaulis; Alyssum citrinum; Aquilegia canadensis* and *A. caerulea* (the Rocky Mountain columbine); *Heuchera sanguinea; Arabis alpina florepleno,* and *Aubrietia* in variety. May ushers in *Veronica repens* and *V. spuria;* the *Violas; Phlox subulata* in variety and *Phlox amoena; Gypsophila repens* and *G. cerastoides; Mazus pumilio; Androsace sarmentosum; Erinus alpinus;* Saxifrage without limit; *Silene alpestris, S. schafta,* and the heavenly blue *Myosotis alpestris. Iris verna* and *Iris cristata,* both native species, and *Iris arenaria,* an unusual little yellow gem, give rare satisfaction for their four inches of height.

In June we have the large family of bellflowers, *Campanula rotundifolia, C. carpatica* and *C. pusilla.* The hardy pinks add color and fragrance in *Dianthus neglectus, D. deltoides, D. arenarius* and *D. alpinus,* and a member of the carnation family, *Saponaria ocymoides,* has showers of pink flowers. Infinite varieties of sedums and evergreens hold forth in July and later months, *Sedun dasyphyllum* and *S. sieboldii* being particularly showy. By the way, the dwarf sedums are excellent ground covers in the rock garden, as well as the saxifrages and thymes.

Then for several months, we find in bloom *Linaria alpina, Viola cornuta, Anemone hupehensis, Aster alpinus, Helianthemum* in variety, the closed gentian, *Thalictrum minus,* and many more lovely creations.

Several varieties of lilies are well adapted for rock gardens and small colonies of *Lilium croceum, L. martagon, L. tenuifolium,* and *L. umbellatum grandiflorum* always charm the visitor. For background and individual specimens, consider the use of broad-leaved evergreens; azaleas in variety, *Abelia chinensis, Cotoneaster horizontalis* and *C. divaricata; Pyracantha coccinea, Leucothoe catesbaei,* Japanese Holly; and *Daphne cneorum.* The low-growing conifers include the dwarf spruces, Mugho pine, and dwarf junipers—*Juniper chinensis, J. sargenti, J. procumbens, J. squamata,* Waukegan juniper, and the columnar type, *J. communis hibernica nana.* For tall and medium growth in the background, select Norway spruce, Swiss mountain pine, the hemlocks, arborvitae and Lawson cypress.

The making of rock gardens by amateurs in the United States has but recently come into popularity, so that our practical knowledge is rather limited. The following books are recommended for delightful and profitable perusal: *Adventures in My Rock Garden* and *Pleasures and Problems in the Rock Garden,* both by Louise Beebe Wilder; *The English Rock Garden,* by Reginald Farrer, and *Alpine Flowers and Rock Gardens,* by Walter Page Wright. M. Henri Correvon's articles are also extremely valuable.

Rock gardening is not quite as strenuous as other types of flower farming, and if the plants are properly planted in the first place, and the rocks firmly placed, we have a very good start. It is not such a task to maintain it. The real joy comes with the flowers in the spring.

The CAMP ALARM CLOCK

He Taps Us Into Wakefulness

by Carlton C. Gordon

HE was our alarm clock. Every morning as the sun rose over the hills, his tap-tap-tap on the woodshed resounded through the whole house and over the lake, and we stirred ourselves from the bunks, and prepared for the morning dip in the gleaming waters.

He was only a yellow-bellied sapsucker, and why he should choose the dryest of posts instead of juicier meat we could not understand Perhaps because he enjoyed the drum music he made for us from this timber. Perhaps he was after insect life.

All during our stay at our camp near Albany he supplied alarm clock service, and gladly. We anticipate his friendship and his aid next summer. We hope the post on which he worked is not all gone, driving him to new parts.

"THE MORNING'S AT SUNRISE"

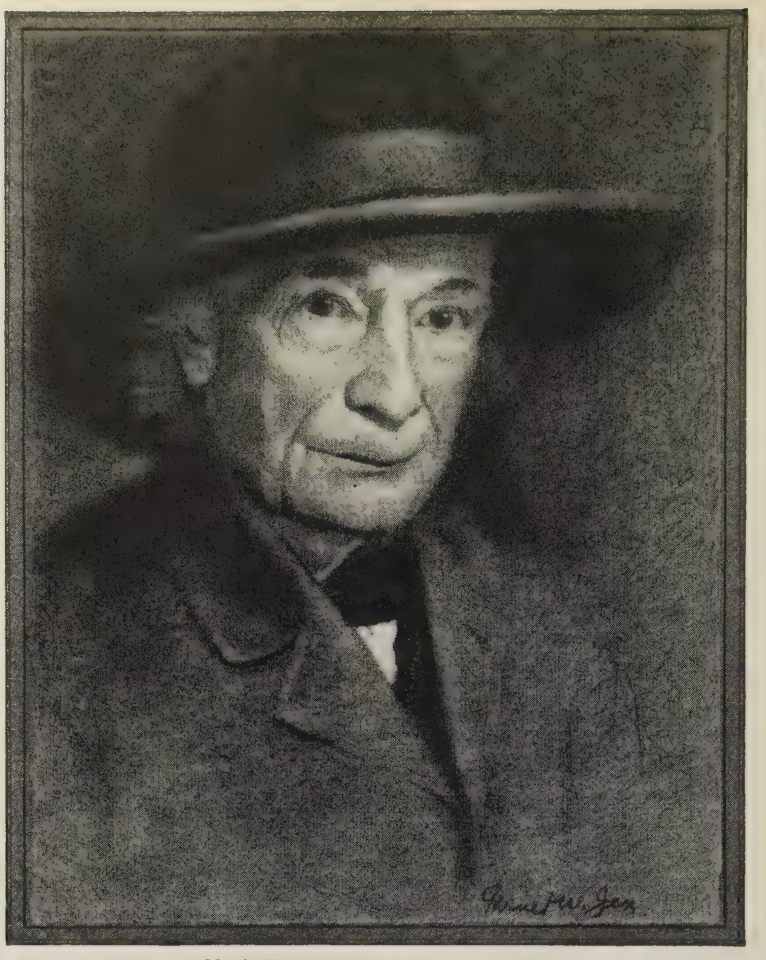
The sapsucker changes an old verse with his tapping

FABRE, *"Homer of Insects"*

The Story of the Man Whose Life Was Dedicated as Biographer of the Insect World

by Donald Culross Peattie

Illustrated by Garnet W. Jex



JEAN HENRI FABRE—1823 to 1915

BORN in the sunny south of France, Dec. 22, 1823, Jean Henri Fabre came into this world a poor boy, and he grew up without advantages, following his father's wandering footsteps about the country and receiving an irregular schooling, a quiet boy in whom no one perceived anything remarkable. Yet this was the man whom Victor Hugo was to call "l'Homère des insectes" and Darwin "the inimitable observer". Indeed, his family and his young companions must have thought him very silly if not quite crazy to spend his time watching butterflies and bees and beetles while they played.

Somehow the lad got the rudiments of an education, and by dint of working to pay his way, he got somehow, too, through a normal school, graduating at the age of nineteen, to take a place in a boy's high school as a teacher. Schools of those days were miserable affairs, crowded, dirty, dark, hermetically sealed against fresh air, and the unruly, uncleanly young ruffians Fabre had to teach were unaccustomed to any rule but that of the fear of punishment. Somehow, though, he managed to win their respect and even their interest, and he triumphed over the severe test of these first days of his manhood when the realistic and grumpy side of life was uppermost. Romance came, though, to lighten his days. At twenty-one he had courted and married a beautiful young woman who shared with him the poverty of his early years.

For a while Fabre lived in Corsica; then he secured a position in the college at Avignon. Here his ability as a teacher began to be noticed; his lovable personality, his boundless enthusiasm, coupled with the beautiful works which were beginning to flow from his pen, attracted attention, and when the great Pasteur who was studying the disease of the silk worm then ravaging France wished to learn the life history of the silk moth, he journeyed to Avignon to consult the young Fabre.

The life of Fabre from that time on is strangely uneventful; he was so wrapped up in the world of insects that he seemed not to see what went on around him in the world of men; people found him distant and eccentric, and he declined government positions and honors, even resigning his position in the college and retiring to Serignan to spend his life there, writing for a living text books for schools and popular works on the marvels of insect life. There he lived, in a provincial town, seldom troubling to travel away from it. He had no need, for the world came to his door. He saw the countless generations of insects come and go, and nothing escaped him; he saw the new theories arise in science and die away again or live out a precarious existence, and no general theory interested him very greatly. On the theories of evolution he even poured out his scorn and humor; he was the last scientist of repute to hold out against the belief in the change of life-forms.

Yet though Fabre survived to the age of ninety-two without having more adventures than befall some men in as many days, the excitements and varied fortunes of his own world crowded thick and fast about him. Someone once asked the hermit Thoreau if he had travelled. "Yes," replied the poet-naturalist, "I have travelled a great deal—around Concord." The same might be said of Fabre; he travelled to the ends of the universe, in his garden in Serignan. So tireless was his research, so fluent his pen, that it would be impossible here to mention by name one tenth of the things he discovered and wrote. All one can tell of him now is what he did for science.

When Fabre brought his great mind to entomology the subject was almost in the dark ages in some respects. It is true that an enormous number of species of insects had been described and classified and named; but as

for the why and the wherefore of the marvelous habits and customs of insects, all was speculation and uncertainty. Men supposed to be authorities on entomology made mere guesses at how certain wasps manage to render helpless the beetles on which they prey so that they keep for themselves a supply of fresh meat. It was believed that beetles "help" each other carry loads; that spiders when touched curl up "pretending to be dead," and so forth. Fabre showed that these apparent actions on the part of insects were not what they seemed, and he proved his points by the experimental method.

Today experiment dominates all biology; in Fabre's time it was a new idea, and Fabre was the first to use it on insects. For instance, it was known that the insect Osmia laid male and female eggs, the large female eggs at the bottom of a hollow reed stem, the small male eggs at the top. Fabre wished to know, instead of guessing as other men had done, whether the insect knew what it was doing. He put the egg-laying female on reeds of various sizes such as would accommodate, by their cell structure, only eggs of one or the other size. He found that the female adapted her habits to the changed conditions, putting only small eggs in small cells, though obviously a small egg could have been laid in a large cell perfectly well. In other words the female Osmia chose to lay an egg of a certain sex. This experiment carries the mind immediately into the realm of philosophy, for we at once ask ourselves what we mean when we say that the insect *knew* what she was doing, that she *chose* to lay eggs of a certain sex. Into the dangerous seas of philosophical entomology Fabre had the skill and courage to launch the craft of his mind, and he came safely to port when he drew his conclusions about instinct and intelligence.

CORNELIA CLARKE

BLACK AND WHITE JUMPING SPIDER

Men are distinguished from all other animals by intelligence; insects do the marvelous things they do by instinct. But what are instinct and intelligence? There is a knotty question that has baffled countless thinkers. Instinct, Fabre finds, is not the acquired experience of the millions of generations of insects; it is a gift with which insects as a class started out, as much as birds, ever since they have been birds, have had wings. "Instinct apprehends nothing and forgets nothing; instinct is unalterable by time," says Fabre. "But," he tells us elsewhere, "pure instinct alone would leave the insect disarmed, in constant conflict with circumstances..... A guide is needed. This guide the insect certainly possesses in a marked degree. Here it is conscious and perfects itself by experience. Not daring to call this aptitude rudimentary intelligence, a name too broad for it, I shall term it discernment." The female Osmia had *discerned* that conditions were changed when Fabre placed her on a reed with only large cells, and changed her actions accordingly. Thus did Fabre clear up some of the mists that hang around the most astonishing phenomenon in the animal world, the life habits of insects.

And if ever anybody made us realize the wonder of insect life it was the seer of Serignan. He could make a cricket's life, its courtship, its perils, and its struggles seem more vital than the career of any Caesar; he could transport you to a world where everything centered around the glow worm; in another book he could make life look as though it existed for the purpose of giving the parasitic wasps the right to life, liberty and the pursuit of their prey. He did not humanize insects as a sentimental writer would have done; he de-humanized the reader's point of view, and made him feel that nothing mattered except the insect that you and Fabre were studying together. He has been called the poet of science, and he did write poems in the Provençal tongue, but he was more nearly the voice of the insects themselves, explaining, recounting, rejoicing or bewailing. No mere rhapsodist of the beauties of Nature could do as much. No other scientist has ever touched those heights.

Fabre has fallen under criticism, of course, as what scientist has not? His brethren have sometimes distrusted him because he had some of the gifts of the poet and because he had a daring philosophical imagination. Perhaps sometimes he draws wrong conclusions from what he sees; certainly he was careless about fixing the right name to the particular species of insect he was discussing. But perhaps no other naturalist who ever lived has been such a patient, minute and skillful observer as Fabre. Great observation linked with ingenious experiment is enough to put any scientist among the immortals. Small defects in his methods can be forgiven, and as for the beauty of his literary style and his ability to write so that all could undertsand him, people who criticise him for this ought to be ashamed of themselves. Fine style is no disgrace, and as for writing popularly it is in a way the most scientific way to write, for if you cannot explain a thing so that all can understand it, then there is danger that you may not know very clearly what you mean yourself.

Fabre died in 1915, a wrinkled old man with a face grown almost as strange as that of an insect, and the same microscopic brilliant eyes. In many ways the most fascinating personality in the history of natural science, future ages will look on his 92 years of life as the golden age of entomology, just as the 92 years of Michael Angelo's life were the golden age of art.

"TO SEE A FLOCK OF THESE MAGNIFICENT CREATURES IN FLIGHT . . . IS TO WITNESS A SIGHT WHICH HAS ALMOST FADED FOREVER"

The White Legions

America's Tallest Birds Seek Refuge

by Alexander Sprunt, Jr.

It is a strange, but indisputable fact that the more striking, handsome and conspicuous certain forms of our native wild life happen to be, the more eager the majority of people seem to be to hasten their destruction. One would think that pride in our natural resources, and pleasure in beholding them, would outweigh any other motive, but such has not been, and is not yet the case. The ever-present man with a gun, overpowered by the desire to "see if he can hit it", has wreaked irrevocable damage, and the impulse to kill something has had dire effect in many quarters.

The problem of altering this deplorable situation is one which many organizations are now trying to solve. Bringing the facts before thinking people has done much to improve the general conditions and, undoubtedly, progress toward the goal is being made. As mentioned in a previous article on our disappearing wild life, it is problematical whether this change has been brought about too late to save the unfortunates which have suffered most under the conditions of modern days.

One of the largest and most imposing birds of America has, through the destructive agencies of mankind, been brought to the last stand. Once abundant, it is now only seen at the rarest intervals in its natural haunts, and in zoological gardens. This bird is the whooping crane.

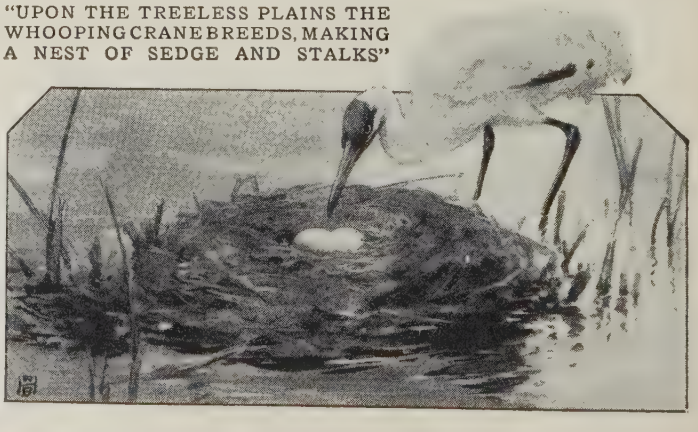
The whooper has much that commands admiration. Enjoying the distinction of being the tallest of our birds, it is also one of the largest. Standing over four feet in height, it has a wing spread of seven and a half, and while this latter measurement is exceeded by others of our birds, its commanding height and striking plumage make it a bird well calculated to stir the respect and admiration of everyone. Except for the head, the top and sides of which are bare and red in color, and for the black primary feathers of the wings, the whole of the plumage is a glistening white. It seems to epitomize dignity, beauty and grace.

To see a flock of these magnificent creatures in flight, their long necks out-stretched in front, the long legs trailing behind, the black-tipped, snowy wings beating the air with ponderous force as they drive the glistening bodies onward, to a chorus of clarion trumpetings, is to witness a sight which has almost faded forever. The very echoes which drifted down from those voyaging flocks were prophetic, for now the white legions are but a memory. Only scattered remnants remain to remind us of their former numbers, an echo of what has been.

There is but one reason for the passing of the whooping crane, and that is the advance of settlement. Always a bird of vast, far-reaching country, their haunts have steadily been encroached upon since the days of early settlers, and the birds themselves were ever targets for the guns of countless hunters. That they once occurred in enormous numbers is a well established fact. Numerous references in the early writings of this country give us this proof. Indeed, it could hardly be otherwise, for such large birds could not have failed to excite comment.

They were not long in feeling the hand of man. That they sometimes made inroads upon the crops of

"UPON THE TREELESS PLAINS THE WHOOPING CRANE BREEDS, MAKING A NEST OF SEDGE AND STALKS"



the early planters is brought out by frequent allusions to their depredations, with the added complacent note which showed that they did not escape the wrath of the farmer. For instance, Thomas Morton, writing in 1632, probably referring in part to this species, says that "Cranes there are greate store,—these sometimes eate our corne, and doe pay for their presumption well enough:—it is a goodly bird in a dishe, and no discommodity."

The former range of this bird embraced the greater part of North America. It nested from northern United States northward, and wintered as far south as Florida and the other Gulf States. The migrations of the cranes always attracted much attention, and during these periods many were killed. Always wary birds, the persecution to which they have been subjected has given them the wildness which is now one of their greatest characteristics and assets.

They are, eminently, birds of open country, and while conspicuous themselves in such localities, they are able to see great distances, and discern an enemy with uncanny ability. On the western prairies, the air, with that peculiar magnifying quality which it possesses, makes a crane seen at a distance seem gigantic, and amusing tales are told of their being mistaken for animals such as mules and antelopes. Legends have formed about them.

WHERE WILL BE ITS HOME?

Driven from the old haunts, shot down by thousands, the whooper, a stately creature with a resonant voice, pleads for sanctuary

It was upon these treeless plains that they once bred within the United States, but now the few which remain have retired to the remote grounds of the Canadian Northwest. The nest is made near water, as a rule, and is quite a mound of rubbish, sedge, and stalks, in which are laid the one, two or three eggs. The nest is guarded jealously, and attempts are made to lure an intruder away by the trick of feigning an injured wing.

A peculiar habit of the birds during the mating season is what is known as the courtship dance, a rather ludicrous performance to human observers. In pairs or in small bands they gather together in the early morning or late afternoon on some slight rise in the plain and indulge in queer antics of bobbing up and down and bowing and jumping about to a chorus of loud, trumpet-like notes.

The voice of the whooping crane is really wonderful, for the resonance and carrying power of the notes possess a remarkable quality. This is due to the fact that the windpipe is often as long as the bird itself, and is coiled in many convolutions within the breastbone, much as the shape of certain horns. It has been said that the notes have been heard for a distance of three miles. Such a volume of sound, coming from a bird's throat, is startling.

In long flights, cranes usually fly in single file, but at times, bunch into irregular flocks. Often, they travel at immense heights, and at considerable speed. As might be supposed, such large birds prove no mean antagonists, and a wounded crane is capable of inflicting severe damage with the heavy beak. Indeed, it has been known to exceed severe damage. A. C. Bent quotes Ernest Thompson Seton as saying that he once knew of an Indian hunter being killed by a whooping crane. He had wounded the bird in both wing and leg, bringing it to the ground but failing to kill it. As he reached the bird, and started to seize it, the bill was driven into his eye with such force that it pierced the brain, and the hunter fell dead across the body of the crane. Searchers who found the bodies related the story, revealed to their keen eyes by the footprints and other signs.

The status of the whooping crane today is indeed precarious. It is among the very rarest of North American birds, and only careful protection will insure its existence. Some ornithologists deem it doomed to extinction, and unless the most stringent measures are adopted, their predictions will be verified. The Federal Government, fully alive to the situation, has placed an unconditional closed season upon the species, barring even the holders of scientific collecting permits from taking a single specimen.

This measure is, of course, a great step toward their

future. Important as the question of shooting is, however, another element must be considered. This is the matter of their breeding grounds. As mentioned previously, they are birds of the wide prairies, and the wilder the country, the better suited are the birds. In the United States, they no longer breed, except perhaps in a very few restricted localities.

In the plains of the Canadian wilderness, the crane is making its last stand. There are vast stretches of territory there on which the remainder may still raise their young. But these places will not long remain inviolate. In many places, the government has set aside large tracts as national parks, where all life is protected. Some such measure must be taken to save the crane, some reservation must be created wherein, under the strictest protection, these magnificent birds may retire to propagate their kind, without fear of molestation.

The Canadian Government is always willing and ready to join hands with us in any endeavor to preserve the wild life of this continent, as has been abundantly proven. If we, here in the United States, uphold our endeavor to protect the cranes from gunners, our friends across the border will doubtless see to it that the birds are allowed to nest in peace. When this time comes, and not till then, will the remnants of the white legions be assured the opportunity to live their lives in safety, and continue to perpetuate the race. And there is no bird in all North America that more fully deserves our help than this great marsh dweller.

Shepherd Art

It Passes the Time

by Wallace Hutchinson

WORKINGS IN CHARCOAL
On the vertebrae of a one-time horse. It passes lonely hours

OLD MEN OF MOUNTAINS
Like Chinese Gods. Sheep's wool forms the whiskers, stuck with pitch

STRANGE designs and caricatures, drawn on rocks and pieces of bone, are often found by travelers in the high mountainous country of the West. These are usually the work of sheepherders—the men who hold the prize "lonesome job" in all the world. All summer long they live above timberline with their sheep, having little or nothing to read and no one to talk to for weeks at a time except their faithful collie dog. Such men naturally turn to primitive forms of amusement. Some build cairns of rock on the mountain peaks around which their sheep graze; others, more gifted by Nature, spend long laborious hours sketching weird animals and faces with pieces of charcoal taken from their camp fire. In this manner they pass the time when not busy tending their flocks.

The most common form of sheepherder's art work is found on the bleached bones of dead animals which are usually to be found scattered in abundance over the western cattle and sheep ranges. The three grizzly faces of old men of the mountains, here shown, are the work of one of these herders. They were drawn with charcoal on the vertebrae of an old horse. The snow-white hair and whiskers which adorn the faces are made of sheep's wool stuck to the bone with pitch from timberline trees. The artist's conception resembles somewhat the strange gods and devils commonly appearing on old Chinese prints.

IN HONOR OF GREATNESS

This statue to Sacagawea, who guided Lewis and Clark, stands in Portland, Oregon

THE HASKIN STUDIO

SHE INTRODUCED THE CARUMS

and was the first to disclose the tastiness of these plants to white men

A Frontier Food

Ipo, or Yampa, Sustained the Pioneers

by Leslie L. Haskin

THE ROAD lay like a dusky ash-gray thread lying crooked on a drab carpet. It wound and twisted restlessly to avoid clumps of silvery sage, stunted juniper and points of rocky scab-land. From the plodding hoofs of a pair of mules that slowly moved down the thread toward the west great clouds of dust swirled upward above the cindery volcanic soil, and hung in stifling clouds over the creaking buckboard and its two occupants. Finally the way pitched abruptly downward into a level flat bounding a small stream, and here the sagebrush grew to the height of a tall man's shoulders, denoting soil of exceptional fertility. Beyond the stream a rough board and tar-paper shack gleamed newly, and still farther away a man with a team of horses and a chain was "yanking out" and "snaking" into piles for burning the tough clumps of sage.

"Ah, a new settler," the driver of the buckboard said. "Here's where we find food."

His companion, whose every move and whose saucer-like eyes, filled with wonder, proclaimed him a tenderfoot, brightened and nodded. He began to wipe the layer of dust from his face.

As the mule team drew up to the door of the shack, an active sun-burned woman appeared.

"Dinner?" she answered the driver's inquiry. "Yes, I guess so. Picket your team out, and open a bale of alfalfa for them; then make yourselves at home. It'll be about an hour before I'm ready."

While the men were washing the woman went to the door and looked long and earnestly down the valley. The new-comers then observed for the first time a group of distant figures moving to and fro, now wandering aimlessly about, now bending as though digging in a low "dobe" flat, the outlines of which were plainly marked by the absence of sage.

Cupping her hands to her mouth their hostess sent a clear, far-carrying "Yo-hoo—" down the valley, and in response a single figure detached itself from the rest and came plodding up the creek. When it approached near enough to be plainly seen it proved to be a woman of the Klamath tribe, old, bent, and infinitely wrinkled, who carried on her arm a shallow pan. Extending the pan and its contents to the homesteader's wife she gutturally demanded: "*I shanahuli kash?*"

Then with an effort of enunciation, and in broken English she interpreted herself: "You wan' ipo?"

"Yes," nodded the woman.

She took the pan into the house and emptied it. Then going to the back of the room she filled it to exactly the same depth with white flour and returned it to its owner. This exchange was evidently quite satisfactory and understood, for with a bob of her head and a toothless grin the squaw accepted it and departed.

Since the contents of the old Indian's pan was evidently intended for their dinner, for the woman was washing it and putting it into a kettle, one of the two visitors—the tenderfoot—seemed greatly interested. From a distance the mass appeared to be composed of

big brownish beans, only uneven in shape and size. Curious, but not wishing to appear inquisitive, he edged towards the table, hoping to solve this question without being observed, but a laugh from the hostess told him that his precautions were fruitless, and brought the embarrassed red to his ears. At the same time the pan was thrust into his hands by the jovial woman.

"I don't blame you for wanting to learn what you're in for before eating any Indian messes," chuckled the housewife. "I'd want to myself. It might be crickets, or snakes, or caterpillars—more likely than not, in fact—but you needn't be afraid this time; it's only ipo."

Thus encouraged he examined the dish closely, and later he ate of it with great relish, heaped on fried venison and seasoned with butter, and declared it very good.

That was the tenderfoot's first taste of ipo. Later he was to eat it many, many times, and never did it lose its relish. After dinner he visited the Indians' camp and saw these small, plump, clustered roots dug from the ground. When still fresh they were covered with a black skin, and were fat and meaty within like the kernels of big misshapen peanuts. He saw, also, how these roots were placed in baskets and set in the creek while the squaws worked and trod them with bare feet to remove the coarse outer skin and to make them as smooth and clean (?) as those of which he had eaten. Even this, however, could not dampen his enthusiasm for the new food.

THE HASKIN STUDIO

A NEGLECTED FOOD

The delectable roots of ipo have been almost forgotten

That was many years ago. Today the rough homesteads are replaced by thriving, fertile farms, and the farmers with their irrigated gardens now have no reason for calling upon the Indians for wild roots. Even the Indians themselves are forgetting this fine food. Seldom now do they come to the door to trade their heaped-up pans or baskets of ipo for an equal measure of wheat flour, but still the plants, neglected, grow just as abundantly as ever in the fields and valleys of the West, harvested only by the ground-squirrels and gophers, yet only waiting the coming of some one to gather and value them.

These plants, for there are three species, are known botanically as carum—*Carum kelloggii, Carum gairdneri,* and *Carum oreganum*—and are closely allied to the caraway of commerce, *Carum carui.* Among the original Klamath Indians they were called *kash,* but by present members of the tribe and by most white men, they are universally known as ipo, variously spelled epa, apo, or apau. The Klamath Indians, those few who still remember old times, will tell you that the word ipo comes from the south, and was the neighborly Shasta's tribal name for the plant. There is little doubt, however, that the word is not truly of Shastan origin, but is a corruption of the Spanish-Californian *apio,* meaning celery, which the Carums somewhat resemble.

The carum is not valued by the Klamath Indians alone. Among the Snake, Giosute, and Ute tribes it is also used, but bears the name of yampa. Sacagawea, guide, councilor and interpreter for Lewis and Clark, has the honor of being the first person to introduce this plant to the whites under that name. This wonderful Indian woman is worthy of all fame. Carrying her tiny infant on her back she traveled afoot over hundreds of miles of the roughest mountains, plains, and deserts, and by her knowledge of wild foods contributed greatly to the success of this daring expedition.

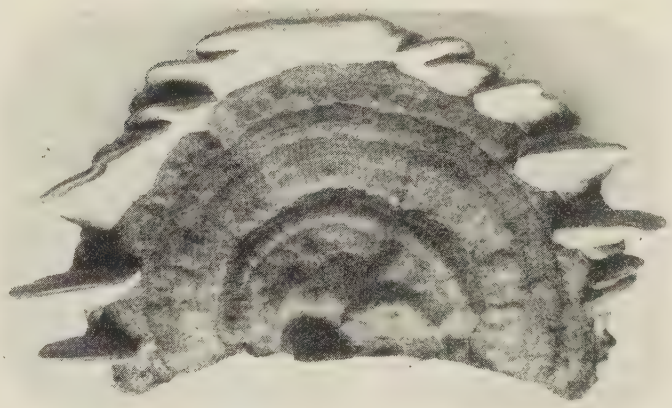
After Lewis and Clark, Captain John C. Fremont is the next to fully celebrate the fine qualities of the yampa. He it was who when he tasted of it declared it to be the finest of all Indian roots. Fremont ate it as a vegetable with wild duck. Perhaps it may yet be introduced into our gardens and then "Creamed ipo, *a la Fremont*" will find a prominent place on fashionable bills of fare to add another tasty vegetable.

A Persistent Bracket Fungus

It Determines to Grow Horizontally

by Edward A. Preble

Everyone who is much in the woods must have seen the curious growths of *Fomes applanatus,* one of the most common of our so-called bracket fungi, which infest the trunks and larger branches of many forest trees, including the beeches and maples. What is seen by the ordinary observer is only the fruiting body, whose purpose it is to produce and ripen the tiny spores by which the race of *Fomes* is carried on. Concealed within the tissues of the ill-fated tree is the real plant with its slender but deadly root-like growths insinuating themselves into the very heart of their host. As these grow and extend their course they take from the tree its life, and finally when the wood is well infected the plant develops its fruit, the shelf or bracket. From myriads of tiny pore-like cavities on its lower surface, smooth as velvet, there are given forth the microscopic spores, which, wafted by the friendly wind, find lodgment in wounds or knot-holes of other trees, sometimes healthy ones, and there perchance develop into other destroyers.



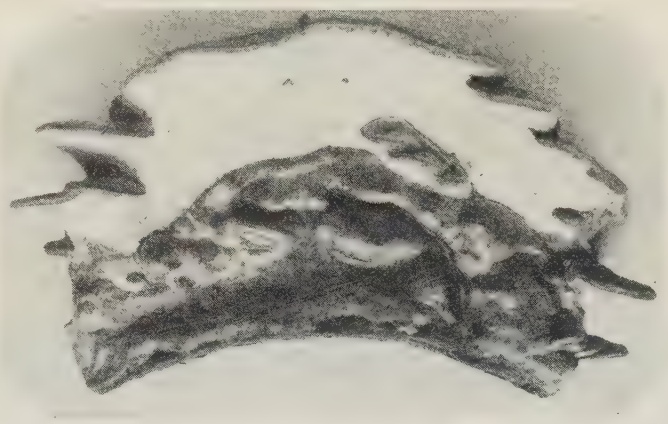
THE UPPER FACE OF THE FUNGUS

By the fall of the host, the fungus assumes an unnatural position, but continues to grow

Such a plant grew on the trunk of a tree near the camp of Henry Dennison in Washington County, Maine. It was a good-sized tree, but after a few years of persecution the sturdy trunk was so weakened that it fell to the ground. But the destroyer was not dead, and the fallen and decaying trunk still gave sustenance to the parasite, and strength to add to its growth.

Now it is the law of the bracket fungus that its shelf-like spore-bearer must always add to its growth horizontally, and its host lay prone, so that the edge of the broad disk, a foot across, pointed to the sky. So, under the urge to carry on, from its periphery sprung dozens of smaller brackets, each with its horny upper surface, and its soft lower side, where are nurtured the tiny spores. True to the law the edge of each disk grew toward the horizon. Where the slope of the mother edge was steepest each kept in some degree its individuality, while at the upper part of the periphery what would have been several of the new brackets joined forces, and produced one instead of many disks.

The pair of pictures could tell the story better if it included the portrait of the specimen as it first grew on the erect trunk, but its appearance at that time is fairly well represented in the view of the upper surface, with the newer outgrowths eliminated. Here are seen the records of the successive annual growths which were added to the periphery of the fruiting body, the whole viewed as one would have looked at it from a perch on the trunk above. Then came the unknown catastrophe, perhaps a winter storm, that laid low the host, and the two or three years of battle of the fungus to carry on.



THE LOWER SURFACE ALSO CHANGES

Here the lower surfaces of the new growths coalesce with that of the parent

A curious effect of the struggle of the fungus to adjust itself to the new position is seen in the relation of the upper and lower surfaces of the new growths. Though each strove to be a separate entity, with its hard upper surface, and its velvety lower part, its conduct was still ruled in a measure by the mother growth, and where her lower surface touched those of her offspring, they tended to coalesce with hers, as shown in the lower picture.

"They Also Serve Who Only Stand and Wait"

by Fred E. Brooks

Photographs by the Author

ONE day in early April I loitered by a little brook which flows through one of my brushy back fields. The weather was warm and the air filled with spring sounds and spring odors. Suddenly a fleeting little breeze sailed by, bearing to some unknown harbor a cargo of perfume gathered from the blossoms of wild spice bushes. I cast about to discover the port at which the breeze had loaded and soon saw to windward a clump of spice bushes growing close against a large rock near the foot of the adjacent hill-slope. The rock was a rough, gray sandstone, three or four feet across and breast-high to a man. I approached the bushes to enjoy at close range the delightful fragrance of the small, honey-yellow flowers. Standing thus, drinking in the delicate odor, my eyes rested on the nearby rock and there came an almost forgotten memory of an incident which had taken place years before at that very spot.

That hill-slope had been part of my father's farm, and at the time which I now recalled, I was helping as a mere boy to transform a strip of the land from virgin forest to a tillable field. The clearing had progressed to the point at which the ground lay covered with tree trunks which had been felled and chopped into sections twelve or fifteen feet in length. We were now rolling the logs into heaps to be burned. Several of the neighbor men had come to help with the heavy work and all day long there was heaving and sweating and cheerful good fellowship as the logs were skillfully brought together to be fired.

Every man present was an expert at the business. All knew the art and instinctively practiced the ethics of log-rolling as it was done in the original meaning of the term. As a matter of course the heaps were built with the hot-burning hickory, birch and black gum logs at the bottom, and the sappy chestnut and red oak logs on top, so that the flames from the combustible foundation would melt to ashes those above. When a heavy log was to be moved from its bed every man knew just where and how to insert his spike to best advantage. Each was alert lest another receive suddenly too heavy a share of the burden, and not one but was able and willing to hold or to lift an ox-load when it fell to his lot.

I was water-boy that day, and had returned to the clearing with a pail filled from the old wooden bucket just as the log-rollers came to a mammoth and long-fallen oak log which lay partly sunken in the accumulation of mouldering leaves immediately above the rock where the spice bushes are now growing. The log was water-soaked and slippery and the rock was directly in the path of its movement to the heap. The log must needs be lifted straight up so that a pole could be thrust under it at the center. This pole when in place would serve as a pivot upon which the log could be turned so that it would be out of the way of the obstructing rock.

For the preliminary lift some of the spikes were set for prying and others for lifting. Gradually one end of the log was raised, an inch at a time. Then six men rammed their spikes well under the log. With the advantage of this "long holt", as they called it, they now prepared to lift the log so that the pole could be inserted by the two men awaiting the moment.

Six men set their feet firmly and bent their backs to get their mighty shoulders beneath their spikes. When all were ready the word was given and the six shoulders came up. I still remember how the stiff dogwood spikes bent, how the feet of the men sank into the ground and how the cords stood out on their sunburnt necks. But the log rose; it had to rise. Then, with a quick lunge, the pole was inserted and the lifters relaxed and allowed the log to drop.

The heavy part of the task accomplished, the men rested for a moment while my tin cup was filled and passed again and again. Before resuming work my father brought his spike down on the rock with a thump and said: "I wonder what that rock was made for? It will always be in the way here. Do you suppose it will ever be of any use in the world?"

Among the log-rollers was one good old man who was always a sort of oracle in any company. I regarded him at that time as being old, although I now recall that his long

WAITING ITS CALL TO BE OF SERVICE

It has sheltered a nest and a beautiful fern and nurtured a song and a sweet odor

beard was black, his kindly eyes bright and clear and his long back as straight and strong as one of the young hickories in the nearby woods. "Yes", said he, "it sometime will be. Everything is. Nothing was made entirely in vain."

After a lapse of nearly half a century the question and answer came back to me as though the conversation had been yesterday, and I remembered how awed I had been by this statement of theology. For almost fifty years the rock had rested there, solid and silent, awaiting the time when it might fulfil the prophecy of the good old man. I noticed that the roots of the spice bushes had crept back into the cool, moist soil beneath the rock and wondered if the flowers were not more profuse and fragrant because of the well nourished roots.

THE CAROLINA WREN LOOKED DOWN INTO THE BROWN EYES OF ITS MATE

BOULDER FERNS NODDED BY THE SIDE OF THE GREAT ROCK

After that April day I frequently visited the rock wondering if ever the time would come when it would serve a useful purpose in the world. In the succeeding May a little bed of graceful boulder ferns came up on the sheltered side of the rock and all summer long their lacy fronds nodded prettily in every passing breeze. Against the cool background of gray stone they gave a touch of airy beauty to an otherwise somber spot. Here was a natural rock garden—and I thought of Keats' line: "A thing of beauty is a joy forever".

Again, later in the season, I went to the rock and found that a pair of Carolina wrens had built their nest close against the stone, back of the spice bushes. The female was sitting on her six speckled eggs half hidden in the feathery lining of the nest. She flew away and scolded nervously when I approached and disturbed her.

I then secreted myself near and waited to see what would take place. Presently the female came back to the rock and settled herself contentedly on the nest. The male followed, alighting on the topmost tip of the spice bushes. "Wheedle-wheedle-wheedle", he called, the sweet, round notes echoing through the little valley. Time and again the song was repeated, loud and clear and ringing, a wonderful voice for such a little bird. Then he dropped lightly to the top of the rock and looked down over the edge, gazing, I think, into the eyes of his little brown mate nestling below. Birds usually look toward heaven when they sing, but this wren now sang as he looked downward, a dainty, sweet song. I felt like a rude intruder at this pretty little exhibition of domestic intimacy. Then back he flew to his perch in the spice bushes and renewed his song with increased energy. And the sun went down on his unfinished symphony.

The spring has gone, and the nesting birds have vanished into the wilderness with their young. The ferns have drooped with the summer heat, and grown brown and withered with the fall. The spice bush is bare, now, and waiting for the coming of the snow. Only the rock stands there, waiting for the time when it will be split into building blocks or ground into sand for a concrete wall, or blasted into fragments for road building. The prophecy of that old man, as he meant it with his type of utilitarianism, has not yet come true. Yet there have been a nest, a song, a sweet odor and a beautiful fern; here has been a touch of beauty that at least one person has seen and been happier for seeing. "They also serve—"

The changes that have been wrought by man in his advance over the earth mark corresponding changes in the man himself; and in no particular is this more evident than it is in garden making. When the world was a wilderness, ranged by wild beasts and men less tame than the gardeners, defensive boundaries were a necessity, and within these boundaries, upon this bit of earth which each had thus claimed for himself, no hint of the wilderness could be tolerated. For it was a foe and harbored foes—and no honest husbandman could possibly have temporized with it for an instant.

This I think explains the careful exclusion of any suggestion of Nature in the old designs; the love of artificial forms; the stiff lines; the unyielding repression; the straight clipped walls of sternly disciplined growth. And it is a perfectly natural taste, considered in this light. For it is only by contrast that we comprehend, and comprehending, enjoy; thus the gardens that were made, while the struggle against Nature and the wilderness was going on, were designed instinctively to afford the greatest possible contrast to Nature and the wilderness. While those that have come later, as earth has gradually grown to be more and more under man's dominion, we shall see, have, little by little, become more artfully like Nature.—Old-Fashioned Gardening—GRACE TABOR.

HUNTERS of the TREE TOPS

Wherein the Cicada-Killers do Their Stuff

by A. B. Champlain

HERE is a wasp of no ordinary qualities, one which for size and ferocious instincts has no match in "waspdom," at least in the Eastern Central States. You may have seen her,—a great, handsome, black or rusty-coated creature, about one and one half inches in length, with sharp jaws, six strong legs, and a sleek, tapering abdomen banded and spotted with yellow and terminating with her fiery tail.

Such a conspicuous insect is the cicada-killer, one of the digger wasps, whose buzzing "motors" may be heard in the hottest late summer sunshine, as she flits among the tree-tops bent on incipient mischief.

Since we are here together, and good friends, we will spy on her as she follows her nefarious purpose. We will be careful, of course, to avoid any intimate contact as she would resent our interference by stinging us severely. As we watch, we hear the cicadas or "dog-day harvest flies" among the foliage. They are singing away in their own peculiar fashion,—why, nobody knows. The wasp apparently gets these vibrations also, perhaps with her own private "receiving set". She becomes alert and with wings vibrating or stiffened to the breeze, follows the direction of the sound. With unerring instinct she locates her prey and the poor cicada, interrupted in the midst of its noon-day Sonata, emits a squawk of distress,—and all is over. Our wasp has pounced upon the hapless victim and with cruel indifference quickly plunged her sting into its body. Still alive, but paralyzed and helpless, the cicada is carried away in the grasp of this fierce insect of prey. As we follow her in labored flight,—for the burden is no small one,—we find that she is on the way to her den in a nearby clayey bank. She falls to the earth, and with determined sagacity, straddles her victim and drags it by main strength over the ground into her burrow.

These burrows, which the digger-wasp has prepared with instinctive foresight, are fourteen inches to two feet deep. At the end of the burrow there is a larger round space or cell about an inch and a half in diameter. Sometimes there are a number of branching tunnels with additional cells at the end. The helpless cicada, alive but unable to move, is placed in one of these cells. The wasp, as callous as can be, then proceeds to lay a white, elongate egg just under the middle leg of her paralyzed victim. After all the little rooms are filled in a like manner she shuts the eggs and the cicadas up in these prison-like cells and goes her way, happy in the feeling that she has done her duty by her progeny.

Now this is not the worst of it. The egg was shut up with the helpless cicada, so that upon hatching, the infant wasp, in the grub or larval stage, would have a proper amount of food to eat. Dead cicadas wouldn't do, because the little grubs love fresh meat. After hatching the grub begins having its dinner. Head downward it is digging between the segments of the cicada for nourishment. After a week or so it gets full and incidentally attains its growth. Hideous infant epicure.

Now, sleek and satisfied, it spins a white silken cocoon, mixed with earth and debris, and proceeds to rest throughout the winter. In the following spring it takes another, deeper sleep for a short period in the pupal or true resting stage. Another transformation and the perfect insect is ready to emerge, a full grown digger-wasp or cicada-killer, with wings and legs and jaws just itching to start out stalking the unwary insect. It chews its way out of the cocoon and proceeds to work its way up the burrow to the surface. Just in time to come out and hunt in the summer sunshine.

A VICTIM

She paralyzes the cicada, and drags him to her burrow, where he serves her young

THE CICADA-KILLER

She is the Attila of waspdom, and the scourge of the insect world

SHE KNEW OF THE DOGS THAT GAVE FLEECE
Jumbo, asleep beside her, is like them, but is, she said, a white man's dog

Fleece-Bearing Dogs

They Have Passed But Traces of Them Remain

by Douglas Leechman

It was on the Port Madison reservation, just a few miles from Seattle, that I first came across an Indian who could tell me something about the fleece-bearing dogs. She was an old woman; originally, I believe, of the Duwamish. Just a few minutes before, she had returned from the beach with a basketful of clams which were dug within less than a hundred feet of the house and she was now resting in the shade close by an unfinished dug-out canoe that her husband was working on. Old and feeble and surly she appeared.

Nearby slept her dog, who went by the very un-Indian name of Jumbo.

"Do you remember," I asked her, "the dogs whose wool the Indians here used for making blankets?"

"Yes, I remember hearing about them, though I never saw them. My mother knew them, and her mother, and they both made such blankets long ago."

"Were they dogs like Jumbo?" I asked curiously.

"Yes, like Jumbo," she replied, "they were white dogs, with long hair, but Jumbo is not one of them. He is a white man's dog, not an Indian dog."

Still, to be on the safe side, I decided to take Jumbo's picture as well as that of his mistress.

Most of the early explorers of the North Pacific Coast noticed the fine white woolen blankets that the Indians wore. The first true identification of the animal supplying the wool seems to have been made by Ledyard who, in the Journal of Captain Cook's Voyage, speaks of the garments as being "principally made with the hair of their dogs, which are almost white and of the domestic kind."

WEAVING THE YARN MADE FROM THE FLEECE
Photograph of a painting by Paul Kane of this phase of Indian life

It was in May, 1792 that Captain Vancouver came across these dogs. While at Port Orchard, on Puget Sound, he wrote: "The dogs belonging

to this tribe of Indians (at Port Orchard) were numerous, and much resembled those of Pomerania, though in general somewhat larger. They were all shorn as close to the skin as sheep are in England; and so compact were their fleeces, that large portions could be lifted up by a corner without causing any separation. They were composed of a mixture of a coarse kind of wool, with very fine long hair, capable of being spun into yarn. This gave me reason to believe that their woolen clothing might in part be composed of this material mixed with a finer kind of wool from some other animal, as their garments were all too fine to be manufactured from the coarse coating of the dog alone. The abundance of these blankets among the few people we met with, indicates the animal from whence the raw material is procured, to be very common in this neighborhood; but as they have no one domesticated except the dog, their supply of wool for their clothing can only be obtained by hunting the wild creature that produces it; of which we could not obtain the least information."

During the next month while farther north along the coast of an island, Whidby reported that he and his group saw "upwards of two hundred (people) some in their canoes with their families, and others walking along the shore, attended by about forty dogs in a drove, shorn close to the skin like sheep."

AN INDIAN BELLE

Chau-u-wit, a Clallum chief's daughter, wearing dog-hair blanket

Hamilton Smith states that not all of these dogs were pure white. He depicts each as "with pointed, upright ears, docile, but chiefly valuable on account of the immense load of fur which it bears on its back, of white, and brown, and black colours, but having the woolly proportion so great and fine, that it may well be called a fleece."

Every other account seems to agree that the dogs were all white, and it is possible that those described by Hamilton Smith had been accidentally crossed with other dogs. In fact, it was the custom of these Indians to keep their flocks of dogs on small islands to prevent the breed from becoming mixed, a custom which implies that the dogs did not take to the water very readily. This trait is also said to be observable in the Eskimo husky, and lends some shadow of support to the theory that the two breeds are related. It is further recorded that these white, long-haired dogs never barked.

It appears that the wool from the dogs was nearly always mixed with other materials before use. Sometimes it was the wool of the mountain goat, also often used alone, sometimes duck's down, sometimes milk-weed fibre, and sometimes "wild hemp", *Apocynum cannabinum.* When down was used, each minute feather had to be handled separately, the quill extracted and the remaining down rubbed into the dogs' wool.

Before using the wool from the dogs, it had to be cleaned. This was done with diatomaceous earth. A ball of this material, about the size of a man's fist, was heated in a fire of willow-wood. This reduced it to a powder, which was mixed with the wool. The wool was then spread out on a mat, moistened and beaten for a long time with a sword-shaped stick, which had the effect of removing all the natural grease from the hair.

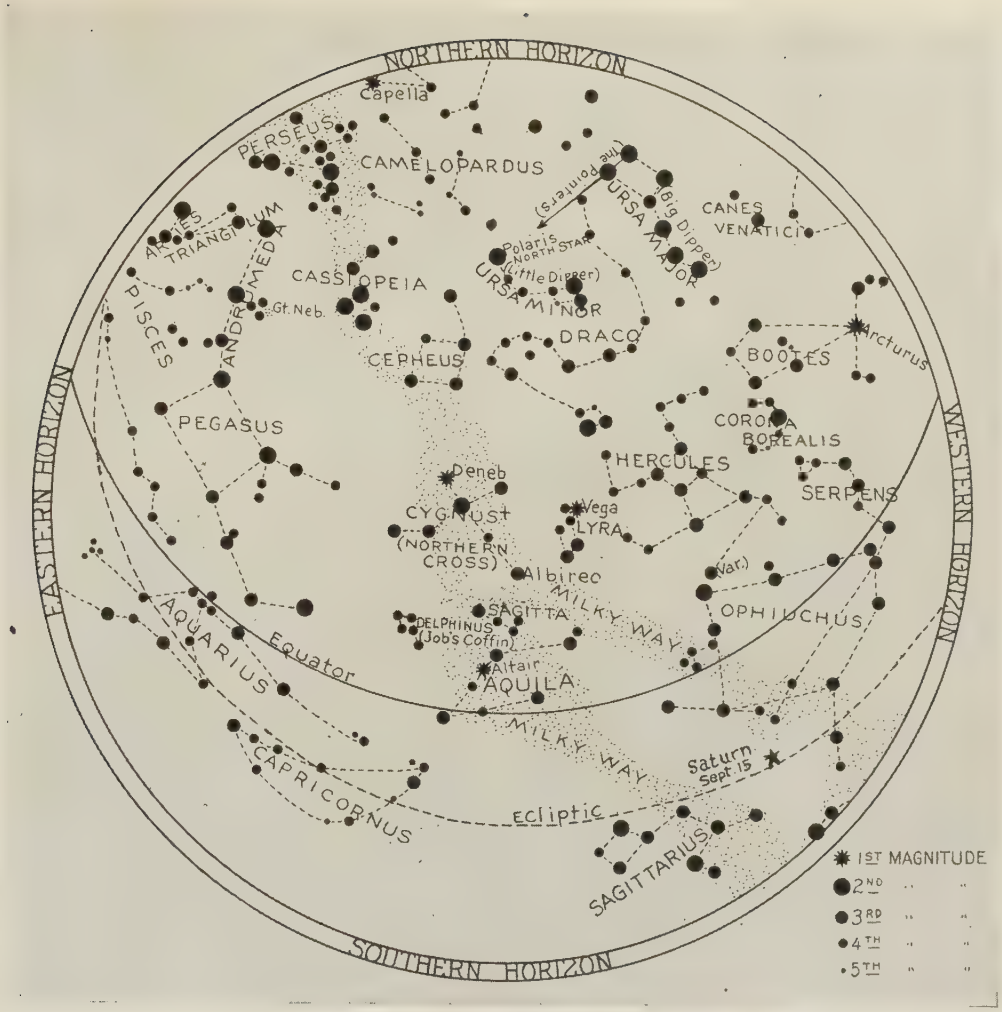
The actual spinning of the yarn could then be undertaken. A bundle of the wool being held in the left hand, it was fed slowly to the right hand and rolled into a yarn on the bare right thigh. The woman making the yarn was careful to keep it of the same thickness throughout, and allowed it to fall into a basket placed ready to catch it as it was twisted. Two separate basketsful were made in this manner. Then, taking the two threads at once, one from each basket, she rolled them about a stick in such a way as to form a large hollow ball, which could be undone from the middle.

The inner end of the ball was fastened to a spindle, which was about three feet long and provided with a heavy disc of wood or bone about a foot across. When the spindle was in use, one end rested on the ground and the other was held by the left hand. The lower surface of the disc was struck with the right hand, causing the spindle to revolve, and the two threads were thus twisted into one, the resulting single thread being wound up on the shaft of the spindle as fast as it was made.

About 1866, J. K. Lord collected a number of blankets woven from this dogs' hair thread and sent them to the British Museum, and these are now among the very few specimens known. Most of them are white and have a loose fringe formed of loops of the weft threads. Sometimes they are ornamented with black zig-zag markings, but this does not imply the use of a black wool as black dyes were available.

It is quite possible that examples of these dog-hair blankets are still awaiting the ardent collector, for many of the Indians still have such remnants of their former glories hoarded up and after they have assured you several times that they have nothing left, will produce some totally unexpected treasure.

Strange things are done by the primitive tribes whose histories are hidden in the tangled jungles of the past. But as strange as any was the custom of shearing these Indian dogs, and the silent way in which it passed.



TO USE, HOLD OVER HEAD WITH TOP TOWARD THE NORTH

This map is adjusted for use on September 1 at 9 p. m., September 15, 8 p.m., and September 30, at 7 p.m.

The Unique Planet

Concerning Saturn, Ring- and Moon-Bedecked

by Isabel M. Lewis

A BEAUTIFUL, yellowish, star-like object may be seen immediately after sunset in the south this month, situated near the boundary between the constellations of Ophiuchus and Sagittarius. It now is about equal in brightness to Altair, to the northeast, though there are times when it outshines all stars except the two brightest, Sirius and Canopus. This is the ringed planet, Saturn, unique in the possession of a system of three concentric rings of enormous size. No great or powerful telescope is needed to show the rings of Saturn. Small telescopes show not only the rings but the brightest and largest of the planet's large satellite family, known as Titan.

It is not certain whether Saturn has nine or ten satellites. In the year 1905 Prof. W. H. Pickering reported the discovery by photography of a tenth satellite which he named Themis, but it has not been possible so far to confirm this discovery. Like the eighth and ninth satellites of Jupiter, also found by photographic means, the reported satellite was very faint and must have been subject to large perturbations by the other satellites which would make it very difficult to predict its future motions. As is also the case with some of the small asteroids, it appears to have been lost before the discovery could be confirmed. There may, indeed, be more than one satellite of Saturn still undiscovered. Phoebe, the ninth moon, was first found by Prof. Pickering in 1898 and aroused great interest at the time because it

was found to be backing around the planet, or moving in retrograde direction, from east to west, instead of from west to east, which is the direction of motion of all the planets and all the satellites known up to that time. Later when the eighth and ninth satellites of Jupiter were discovered it was found that these distant bodies were also moving in the retrograde direction.

It has now been proved mathematically that this direction of motion is more stable than the direct motion for a satellite that is at a very great distance from the planet. There is a point at which the sun's attraction for a satellite would become more powerful than that of the planet and the satellite would leave the control of the planet to become a satellite of the sun. When a satellite is near this limiting distance it seems to be more secure in attendance on the planet if it backs around it instead of moving in the normal direction.

Saturn's rings were originally believed to be solid or liquid but it was finally proved both mathematically and as a result of observation that they were composed of swarms of small meteoric particles or moonlets each of which was revolving around the planet in its own orbit. The fact that one of the satellites, Japetus, has been seen through the rings is sufficient proof in itself that they are not opaque. The actual size of the individual particles is not known but it is estimated that none of them could at the most exceed two or three miles in diameter. The ring system is remarkably thin in comparison with its great extent, for the distance across the three rings is about forty thousand miles while the thickness is estimated to be about ten miles!

The outer edge of the outer ring, called Ring A, is at a distance of one hundred and seventy-one thousand miles from the center of the planet. The width of Ring A is about ten thousand miles. It is separated from the largest and brightest ring, known as Ring B, by a narrow division about two thousand miles wide, which is known as Cassini's Division, after the astronomer who discovered it. Our moon would just fit into the gap.

Ring B is sixteen thousand miles wide and in its brightest portions is as bright as the ball of the planet itself. It in turn is separated from the innermost ring, Ring C, by another narrow division about one thousand miles wide. Ring C is about eleven thousand five hundred miles across and it is known variously as the dusky, crêpe or gauze ring because it is extremely faint and semi-transparent, permitting the ball of the planet to be seen through it. There is a distance of about seven thousand miles between the inner edge of the innermost ring and the surface of the planet. Around the outer edge of the outermost ring only thirty thousand miles away from it, is the nearest of all the satellites of Saturn, tiny Mimas, only four hundred miles in diameter. It completes its long journey around the planet in less than a day. Next in order, outward from the planet, come Enceladus, Tethys, Dione and Rhea, with periods of revolution ranging from one day, nine hours to four days, twelve hours, and with distances from the center of Saturn that range from one hundred and forty eight thousand to three hundred and twenty seven thousand miles. Enceladus is about five hundred and Dione and Tethys seven hundred and eight hundred miles respectively in diameter. The diameter of Rhea, which is about eleven hundred miles, or half that of our moon, is determined from the fact that it takes four minutes to enter or leave the shadow of the planet at the time of its eclipse. Titan shows a very distinct disk in large telescopes and its diameter is estimated to be about two thousand six hundred miles. It takes sixteen days, lacking one hour, to travel once around the planet at a distance from its center of about seven hundred and fifty nine thousand miles. Hyperion comes next in order of distance being a small body with a diameter of only three hundred miles. It lies nine hundred and nineteen thousand miles away from the planet and travels once around it in twenty-one days. Between Hyperion and the next satellite, Japetus, is a great gap of about one million three hundred thousand miles. Its period of revolutions is over seventy-nine days. It is about one thousand miles in diameter or nearly equal to Rhea in size. Phoebe, the ninth satellite already mentioned, is between one hundred and two hundred miles in diameter and takes five hundred and fifty days to back around the planet at a distance of over eight million miles.

It is believed that all of the satellites of Saturn keep the same face turned toward the planet as does our own moon with respect to the earth and as there is a very noticeable variation in the light of some of the satellites in different parts of their orbit it is believed that the material of which each of the two sides consists differs very greatly in reflecting power. In the case of Japetus the variation is very great. The satellites differ widely in density. The largest, Titan, is heavier than the moon and so probably is a solid body with surface crust, but the inner satellites have very low densities and must be gaseous bodies considerably lighter than water.

Saturn itself is unique in the solar system not only because of its ring system but also because its density is only seven-tenths that of water, or in other words because it would float in water. It seems to consist of layers of gases rotating rapidly at different rates about a small central nucleus. It is also possible that it may radiate considerable heat to its satellites. Like Jupiter, it has belts parallel to its equator though less distinct and sharply defined than those of Jupiter and it rotates rapidly in a period of about ten hours. Its belts also are atmospheric phenomena and it has in addition a brilliant, yellowish, equatorial zone and a dark cap of greenish color at the pole. The flattening of the planet's globe is very noticeable, amounting to fully ten per cent, much in excess of that of any other planet. Its equatorial diameter is about seventy-four thousand miles, its polar diameter, sixty six thousand, three hundred miles.

The rings and satellites of the planet lie nearly in the plane of the planet's equator, which is inclined at the high angle of twenty-seven degrees to the plane of the planet's orbit, which, in turn, lies very close to the plane of the ecliptic or the plane of the earth's orbit. It follows from these facts that we are always viewing the rings at varying angles, since the earth lies alternately above and below the plane of the rings as the two bodies travel around the sun. Saturn takes twenty-nine and one-half years to make one revolution around the sun. During about half of this period the earth

lies above the plane of the ring and during the remainder of the period below it. As the angle at which we view the rings continually changes they alternately widen and narrow in appearance and finally, every fifteen years, when the earth crosses the plane of the rings, they completely disappear from the view of even the most powerful telescopes for a brief period. We then see the rings "edge on" and the fact that they are then invisible is proof of their extreme thinness. At the present time the rings are at their widest opening, their width appearing to be about half of their length. The earth is now farthest above their plane and we are looking down upon their northern surface. They were last out of sight in 1921, and seven and a half years from now they will again disappear for a short time as we pass from the northern to the southern side of the ring system. After that, for another fifteen years the earth will lie below the plane of the ring and we will be looking upward at the undersurface of the rings and the southern hemisphere of Saturn will be tipped toward us. The rings are now seen to the best advantage and will be for some months to come, as our position with respect to the plane of the rings changes slowly and their apparent width decreases very gradually.

Why the rings of Saturn? This is a question very frequently asked and it is possible to give an answer to this question that is now generally accepted as the correct one. They are the material for a satellite that was never permitted to form as they lay too close to the planet.

The mathematician Roche, in 1850, proved that if a satellite of any planet lay within a certain definite limit of the surface of the planet it would be so distorted by the tide-raising forces resulting from the planet's attraction that the satellite would be disrupted by the tidal strains. For a satellite of density equal to the planet, this distance is 2.44 times the planet's radius. Mimas, the nearest satellite of Saturn, is distant 3.1 times Saturn's radius so it is safely outside the limit; but not so in the case of the rings. The outer edge of the outer ring is at a distance of 2.3 radii of the planet so the entire ring system lies within Roche's limit and if once a satellite formed it would have been torn asunder by tidal forces; but it is more reasonably assumed that no satellite ever formed because of the existence of these tidal strains which would not allow the particles to gather into one mass, but forced each little particle to behave as a tiny moonlet circling about the planet in its own individual orbit. It might be remarked here that the inner satellite of Mars, Phobos, is dangerously near to the limit set by Roche as one at which a satellite would be torn asunder by tidal strains. Were it a thousand miles nearer the surface of Mars we would probably have two ringed planets in the solar system.

Saturn is now the only planet easily visible in the evening sky. Jupiter does not rise until near midnight in Taurus and is found near the meridian at sunrise. Venus is a fine morning star rising about three hours before the sun on the fifteenth. Mars is in the evening sky in Virgo but too near the sun to be seen to any advantage and though Mercury reaches its greatest distance east of the sun on the twelfth it is not well placed for observation due to the small angle that the ecliptic makes with the horizon at sunset. On the twelfth Mercury is only about ten degrees above the horizon at sunset and sets about three-quarters of an hour after the sun.

Cygnus, Lyra and Aquila are now on or near the meridian and the three first magnitude stars, Vega, Deneb and Altair, are all high in the heavens at no great distance from the zenith while the only other first magnitude star in view at this time, Arcturus, is fast disappearing below the western horizon. The Great Square in Pegasus is now conspicuous in the eastern sky and Hercules and Ophiuchus fill most of the western sky. Thus are the September heavens.

Coast to Coast for Columbine

A NEW YORK to Los Angeles whirlwind stumping campaign for the columbine was completed by Miss Betty Brainerd, New York newspaperwoman, just before this issue went to press. As passenger No. 1 on the first regular transcontinental air-and-rail trip of the Pennsylvania and Atchison, Topeka and Santa Fe Railroads, and the T. A. T., she carried a bouquet of her favorite flower in the air and over the rails from Atlantic to Pacific. At each important stop, a fresh corsage was presented her by enthusiastic delegations of workers in the American Nature Association National Flower Poll, while the great crowds gathered to witness the inauguration of the fastest coast-to-coast service ever established listened to her words of praise of the candidate now running second in the referendum.

MISS BETTY BRAINERD

Mrs. C. C. Marshall, president of the National Life Conservation Society, made the presentation of flowers in New York City, starting Miss Brainerd on her two-day jaunt by train and plane. In Columbus, Mrs. George McDonald, president of the Ohio Conservation Council, and Mrs. M. S. Thompson, National Flower Campaign chairman of the State Federa-

(Continued on page 190)

NATURE NEWS AND Views

Sardine Eggs

The mystery of where the California sardines go to spawn and what their eggs resemble has at last been solved by Dr. E. C. Scofield, associated with the California Division of Fish and Game, who last spring located large numbers of eggs and larvae near Pt. Vincent. He discovered that the eggs were almost transparent, and almost impossible to find. Dr. Scofield's discovery is most important in establishing ranges of migration of adults and drift of young, and solves the long unanswered problem of where the sardine deposits its eggs.

The Oscillating Lake

A body of water that now grows to the size of a great lake, and now dwindles to a mere mudhole leaving thousands of fish stranded, as pictured above, exists near Gainesville, Florida, on State Highway No. 2, and is one of the curiosities of the region, according to Fred Cubberly of Gainesville, who describes it. It is known as Payne's Prairie, named after a famous Seminole chief, King Payne. Near the northern shore is a sink hole through which surface water drains; but occasionally this closes up, forming a huge pond, large enough, in days gone by, for steamboats carrying fruits and vegetables to shipping points. In the fall of 1927, the water suddenly began to go down, leaving the fish stranded on the shores; then the flow stopped, and the prairie again became a lake. Recently a canal has been cut to lower the lake waters, Mr. Cubberly relates, but it is believed that its operation will not cause wholesale destruction of the fish.

California Gardens

In our October, 1928, issue, Elizabeth K. DeForest gave an insight into the gardening possibilities in California, and now the opportunity has arisen for following still more closely horticultural developments in the state through the publication of a new magazine, *Southern California Gardens,* edited by Edna B. Trask, a frequent contributor to Nature Magazine. It started off in May in very attractive fashion; we wish it *bon voyage* and no stormy seas.

Cruelty Behind the Dainty Furs

We note with gratification that the Christian Churches, ever seeking to fall into step with the Great Teacher, whose watchword was mercy, are beginning to take notice of the immeasurable torture that helps support one of the most popular of our fashions, and a form of torment that is in the power of the gentle sex to banish forever from the earth. The latest evidence of this awakening comes to us from *The New Outlook,* happily named organ of the United Church of Canada, and voices a sentiment that we commend, in all earnestness, to her sister churches throughout the world. The editorial refers to a single well-known organization, but many Humane societies, and associations of Nature Lovers, are supporting this worthy cause.

We quote from the issue of April 24:

"It is said that one hundred thousand skins are sold yearly on the markets of North America, and the annual turnover of the fur business in the United States alone is four hundred million dollars. Stark horror lurks behind those figures. Millions of dumb creatures are tortured to death because fashion insists that women shall wear furs. Fashion, not Nature, or necessity, made the decree whereby millions of creatures with flesh and blood and senses like ourselves must suffer long-drawn-out agonies of fear and pain, and die in unspeakable misery before their time.

"A picture lies before us which for sheer callousness and cold-blooded brutality surpasses even the horrors of the Inquisition. It is an illustration from a trapmaker's catalog showing the working of a fiendish instrument: 'See how the flesh of the trapped leg swells into the groove between the two jaw faces, effecting a positive and escape-proof hold.' In the old days the poor thing had a chance of freedom by chewing its foot off, but not now! Look at this: 'Impossible to pull free, even tho the foot be chewed off . . . not a chance to escape.'

"If we saw the trapped animals, or thought the matter through, how many would be content to go on wearing furs procured by such cruel, inhuman, and cowardly devices? An Anti-Steel Trap League formed in Washington, D. C., in 1925 is seeking to have laws passed which will forbid the use of any trap that does not kill instantly or take the animal alive and unhurt. The league has the declared support of the General Federation of Women's Clubs. It must surely have the support of the Christian Churches in seeking to drive out of existence an instrument that is a blot upon our civilization." E. A. P.

Wisconsin Conservation

More than 700 schools have entered in the state-wide conservation contest being conducted as part of the education work by the Wisconsin Conservation Commission, and hundreds more will apply before the contest closes next April 1, the commission announces. Schools may take up one of four projects—tree planting, winter feeding of birds, exhibits at fairs, and 500 word compositions on different conservation subjects. The commission will supply up to 1000 trees per schoolroom, and furnish information on the bird feeding project. Awards of $100 and $50 will later be made as first and second prizes in each division.

Too Much Fish

Gluttony is one of the seven deadly sins, the wages for which are death. So discovered the above-pictured common water-snake one afternoon recently when he tried to swallow a cat fish bigger than he, and died because of his greed. He was seen struggling with the mouthful by Howard Kay Gloyd, of Ottawa University, Kansas, who with a companion was hunting rattlesnakes along the banks of the Solomon River, and a well-directed revolver shot brought him into the realm of specimens. He was recovered from the water, and preserved in formalin, as a lesson to all water-snakes—and humans.

For Bird Lovers

Snowy Egret is the euphonious title under which H. A. Olsen and R. E. Olsen issue a collection of amateur bird notes of interest to every amateur bird lover. As the publication is edited at 172 Manchester Street, Battle Creek, Michigan, the observations are limited mainly to the Middle States region, but there seem to be unlimited possibilities for exchange of notes as the magazine grows. The purpose of the magazine, write the Olsen brothers, who are college students, is to supply information and maintain the interest of real bird lovers: "Some magazines often devote much of their space to association activities, while there may be some readers more interested in birds than in society doings." They will send their paper without charge to those especially interested in birds, in order to get material from a wider geographical range and improve their book.

One Convert

How the sincerity and power of Ernest Thompson Seton's pen turned one man's thoughts away from steel-trapping to sympathy for harassed animals is told by Wallace Kessell, of Auburn, Maine, the convert, in a recent letter. He writes: "I have always had a great desire to trap animals, and last fall, I intended to make my living in the winter by selling furs. Hankering for something to do in the meantime, I went to the library and got two of Mr. Seton's books, *Wahb or the Biography of a Grizzly,* and *Domino, or the Biography of a Silver Fox.* I read the story of the grizzly, and my mind seemed no longer to drift toward trapping grounds; in fact, I wished that I was a bear and could get revenge on men. I read the story of the fox, and if I had been on earth at the time the story took place, I should have started in search of the unmerciful humans who tried so hard to wreck the life of the fox. Whether the story is true or not, I changed my attitude toward wild animals. As Mr. Seton says, "the woods and fields will be completely desolate within a few years unless something is done to prevent the destruction of wild life." Slowly come the changes in popular opinion, but may the number of Mr. Kessells increase rapidly in the next few years!

Boyce Thompson Institute

The Boyce Thompson Institute for Plant Research at Yonkers, New York, is to double the size of its plant, increase the size of its staff from 37 to 60 scientists and thus more adequately meet the demands made upon it, officials recently announced. New buildings were started September 1, to consist principally of a new laboratory situated in the midst of about 700 acres of land, all of which will be devoted to a 400 acre arboretum, experimental fields and greenhouses. The Institute reports large increases in the demand for plant research each year.

A Bird Garden

Mr. and Mrs. Charles Anderson, the cultivators of the famous Bird Garden at 2033 Wilbraham Road, Springfield, Massachusetts, where many varieties of birds nest in the spring, have put the results of their experiences in a little pamphlet entitled *The Bird Garden,* issued by American Home Makers, Inc. This book will help you attract birds to your home,—but better still, the authors will assist in planning a bird garden of your own, upon receipt of information regarding the size of your plot. Theirs is surely a worthwhile step forward toward creating better homes in America.

Curlew Pictures

Motion pictures of the elusive curlews, particularly hard to get at nesting time, have been secured by E. S. Cheney, photographer for the Division of Fish and Game of California, for the Division's moving picture reel. Mr. Cheney shot the nesting birds through a small hole in the blind, which was composed of the hide of a steer, and which must have appeared to the birds merely as the carcass of some unfortunate animal. The film is now on exhibition in California, thanks to Mr. Cheney's ingenious disguise.

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Food *from* Sawdust

The Fawn Mushroom Does the Impossible

by G. G. Nearing

Chemists spend their lives trying to turn the waste of the lumber mill into man's dinner. And all the while Nature has been doing that very thing day after day.

After the whirling saw teeth have droned their way through hundreds or thousands of logs, the portable mill is dismantled and moved away, leaving only the sills and a heap of sawdust. Just an eyesore, you think.

But now the fawn mushroom begins its work, especially if the sawdust is hardwood. The branching white threads which creep slowly about in old logs and stumps find sawdust a much richer growing place. Within a few months this mushroom of the woods becomes used to its touch of civilization and thrives in these unnatural conditions.

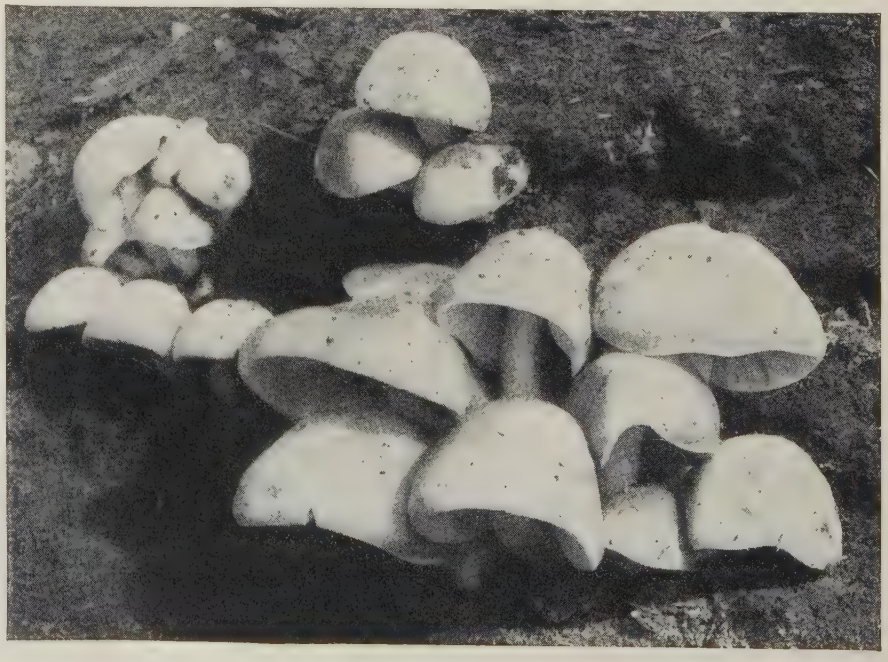
Visit the sawdust pile any damp warm morning between early spring and late fall. You are almost sure to find a crop of fawn mushrooms.

Clumps of twenty or thirty together are common. On a single heap of sawdust in good weather you may find dozens of such clumps. Other specimens stand alone, and these grow often to great size, nine and even ten inches across the cap.

Do not expect any such showing in natural situations on log or stump. There you seldom find more than four or five together, and the size seldom exceeds four or five inches. It takes sawdust to bring out the big yields. In the first or button stage the fawn mushroom comes up silky sepia, chestnut brown, or almost white, and smooth or with odd bumps and wrinkles. Later, as it expands, the color pales to gray, tan or white. The under surface, at first white, turns pink with age.

As other fungi are known to grow on sawdust, do not eat the fawn mushroom until you are thoroughly familiar with its looks and habits. A good mushroom handbook will give photographs, description, and some warning of the kinds to be avoided. Deadly kinds seldom if ever spring up in such a situation, but *Flammula magna,* a reddish or rust color species, might spoil a dinner, and special conditions sometimes bring out unusual fungi.

An expert may safely gather bushels at a time of this fine food which Nature creates from the wastage of the saw picking them all. And what a meal it always makes!



THE FAWN MUSHROOM
Above you get an idea of its size. Below, a clump invites picking

Helps and Hints

FOR HOME AND GARDEN

THE end of the blooming season may be near, but the end of the working season is just out of sight. September is one of the most important months of the gardener's year. Most of the Dutch bulbs are to be planted; most hardy perennials must be moved; lawns should be started; rock gardens planned and built, ready for planting in October; perennial borders laid out. That is, these things should be done in between periods of collecting seed pods, watering lawns and evergreens (don't forget these during the hot spells), planting oriental poppies and peonies, and preparing for fall generally.

* * *

Among the bulbs, tulips, hyacinths, narcissi, croci, snowdrops, squills, chionodoxas are the most desirable ones to be planted. The bulbs should be taken from the boxes of dry sand or soil, in which they have been resting—provided you have given them ideal treatment after they arrived—and planted either in individual holes provided for them, or in trenches with the soil heaped around them afterward. The second method is the best, because the plants can be planted to exact depth, and set firmly in the soil—but like most better methods, it involves considerable labor. If the former way is chosen, be sure not to leave air pockets underneath the bulbs, but make certain that the bulbs sit firmly on the ground. As each type of bulb has its own preference in soil, light, and depth of planting, either use our information service or some authority to determine ideal conditions for your plants.

* * *

Open season on peonies goes into effect about the middle of September, and correct procedure calls for digging up the roots, dividing, and transplanting, or, to supplement your present list of varieties, buy and plant. Several months ago you should have prepared the ground, digging a ditch two or three feet deep, and refilling with top soil and well rotted compost which has been thoroughly mixed. Place the roots so that the eyes will be between two and three inches below the ground. The first winter, mulch with light straw or hay, but not after this time. Of course, add plenty of moisture during the growing season, and add an annual dressing of shredded manure and bone meal worked into the surface of the soil early in the spring. As for the proper soil, an enriched clay loam seems to give the best results. Pick a permanent location the first time, as the plants are not nomadic by nature. And buy worthwhile bulbs—cheapness does not pay.

* * *

Now is the time for all good gardeners to prepare the rock garden. You will find plenty of worthwhile advice on the subject in Margaret Caldwell Lancaster's article, *The Rock Garden,* appearing elsewhere in this issue. For still more information,

Gorgeous Springtime Blooms

SHUMWAY'S "Pedigreed" Bulbs

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from Western America

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12 each of the following 5 fine varieties, (60 bulbs in all) each variety properly labeled and sent postpaid, **for $2.25.**

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E. Citrinum, white, citron center
E. Hendersonii, soft lavender, maroon center

These are excellent for cool pockets in rock gardens. Orders should be placed immediately for autumn delivery.

My catalogue *"California's Choicest Bulbs"* is beautifully illustrated; many things are in color, and cultural notes are minute. it is a book you will enjoy and keep, but it is no more attractive than my larger booklet *"Perennial Plants from all Over the World,"* in which a great variety of rock-plants and garden flowers are offered. Either or both catalogues mailed postpaid on application.

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THE DINGEE & CONARD CO., Box 907 West Grove, Pa.

F. F. Rockwell's valuable handbook, *Rock Gardens,* published by the MacMillan Company, New York, will be useful.

* * *

Among the seed plantings to take place in September, remember annual poppies including the California varieties, forget-me-nots, snapdragons, cornflowers, pinks, pansies, larkspur, bluets and calendula. *Campanulas,* pansies and snapdragons should be kept under glass in a cold frame. Do not mulch them, however, until later in the season.

* * *

The gay young seedlings—sweet williams, foxgloves, gaillardias, hollyhocks and pinks—should be moved to their permanent homes before September gives way to October. Most of the hardy perennials, too, should be moved now, with the exception of mallows, yucca, tritoma and chrysanthemums, whose time seems to be the spring. Borders are planned now, when most everything seems to be on the move—but make your selections carefully, keeping in mind that the surroundings in the fall may vary considerably in color and plant life from that of the spring.

* * *

You probably will be all broken up about the fact that September is the last month in which it is advisable to clip the hedge.

* * *

The best authorities advise September for lawn-making. If your grass plot does not need remaking, however, keep it well watered and clipped. Grass should be mowed as long as it is growing—worse luck!

* * *

With the coming of the first frosts in northern latitudes this month, bring into the house all exotic ferns and other tender house plants. Dwarf asters and calendula should be cut back and potted for growing in the house a little later. Freesias likewise must be put in pots if they are to give early flowers. Straw flowers and everlastings will make fine house decorations if taken when the buds are but slightly out and placed in a dry place upside down. Hang in loose bunches.

* * *

The vegetable garden probably looks rather bare about now, but winter rye and vetch, planted to add humus to the soil, will fill some patches, while asparagus roots, rhubarb roots, perennial onion sets, corn salad and spinach can go in the ground.

* * *

A few other things that may be done when time hangs heavy are: prepare a trench for sweet peas, prop up apple trees and other trees liable to break with poles, build shelters for cosmos and dahlias, clean up trash and old tops of plants in both flower and vegetable gardens, and water your evergreens. And of course, you can always make plans for another year.

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Jordan's *Manual of the Vertebrates* is a title that brings up magic memories in the minds of many a student of a generation past. It is now more than fifty years since the master-teacher brought out that marvelous volume which for the first time enabled the general student of the higher animals to identify, in hand, the majority of creatures that came his way. So deservedly popular was the book that twelve editions, one of which, the fifth, was entirely rewritten, were brought out at intervals. Now the surviving old-time naturalists, and thousands of younger ones, will rejoice that a thirteenth edition is available.

The manual of the vertebrate animals of the Northeastern United States, now for the first time including the marine species, is, of course, by that well-loved veteran, David Starr Jordan, well-known, perhaps, as a foremost authority on fishes, but better known as a Nature lover and writer. The present book is not written in Dr. Jordan's popular style, but is most strictly scientific and severely explicit in its characterizations, as befits a volume that details the features of so many hundreds of species. As in the more recent of the earlier editions, the groups are treated in the order of their evolutionary development, beginning with the lowest of the fish-like creatures, and advancing through the several classes,—the amphibians, reptiles, birds and mammals.

Though the territory covered includes only the southern part of eastern Canada, and our States west to the Dakotas and south to the Carolinas, we believe that it treats beween forty and fifty percent of the North American species.

The names of the specialists who have given of their time and talent to critically review the text devoted to different groups insure the accuracy of the text book.

The volume is published by the World Book Company, Yonkers-on-Hudson, New York, comprises four hundred forty-six pages, and costs four dollars. E. A. P.

Spanish Gardens

As attractively printed as it is informational is *Patio Gardens,* a book written by Helen M. Fox,—author of *Garden Cinderellas,*—illustrated by Ralph L. Reaser and printed by The Macmillan Company. It deals with Spanish gardens—the effect of ceramics, walls, patios, slow-dripping waters and ornaments; the beauties of balconies, the wonders of the heavy perfume of flowers. Miss Fox travelled all over Spain to gather material for the book, clipped a pleasing idea from this garden, another from that; and evidently Mr. Reaser journeyed, too, for never could mere photographs be the inspiration for the sixty-odd charcoal illustrations that seem to breathe the spirit of the Land of Gardens. The style of writing is very simple, yet rhythmic and tuned to

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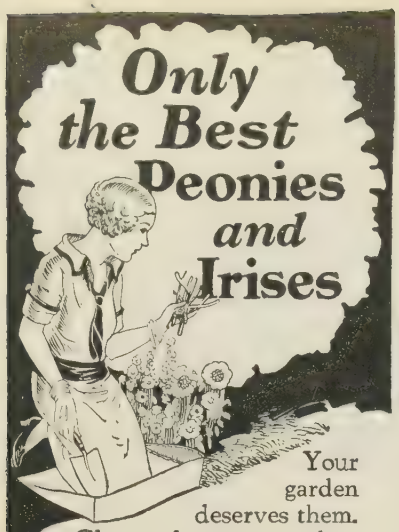

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the subject-matter; and besides a study of the gardens, Miss Fox has given a sketch of the people who make them and live in them, and of the old customs that called them into being. Though devoted entirely to different effects utilized across the water, the book has suggestion after suggestion for use in hot and dry sections of the United States, and is particularly timely, since most of the so-called Spanish touch has a troubled haggard look and an expression of not exactly knowing what it is all about. The book is priced at $6, and for its illustrations, its well written text, and its excellent arrangement and printing, should be worth it to any combined book-lover and garden enthusiast.

Carolina's Winter Birds

A delightful book, *A Guide to the Winter Birds of the North Carolina Sandhills,* has just been issued as a memorial volume dedicated to the late Dr. John Warren Achorn, himself a lover of the sandhills and an enthusiastic bird student. Chapters taken from Dr. Achorn's notes have been added, although Milton P. Skinner is the principal compiler, and Dr. Edmund J. Sawyer is responsible for the 13 beautifully executed color plates which supplement numerous photographic illustrations. The method of gathering material for this book was far different than that usually followed; instead of a study of museum specimens, a survey of preceding texts and a few hasty trips, two winter seasons were spent on the ground studying live specimens. It is designed primarily for bird lovers rather than scientists, and consequently is simply written, with avoidance, whenever possible, of scientific terms; while the ground covered is small in area, yet the treatment is thorough, and the usefulness of the volume is beyond question. As the title indicates, only winter birds, usually neglected, have been studied. The book stands as a worthy memorial to the man who inspired it, and as a valuable addition to the fund of knowledge concerning live birds and their ways. It is distributed at $4 by the Science Press Distributing Company, Grand Central Terminal, New York City.

P. F. H.

The Starling Praised

The much-abused starling has another defender in the person of Marcia Brownell Bready, who, in her book—*Westward the Starling*—justifies the bird's existence by pointing out its economic value, its long lineage, the beauty of its song, and the clever quirks in its personality. More than this—she has taken the bird's music and interpreted it in rhythmic forms and musical notations, a real addition to previous studies on this feathered asset. Her study of the rise of economic ornithology in North America is indeed valuable as a brief survey of what has been done in the field. Knickerbocker Press, New York, are the publishers.

Here and There

Among the month's offering in verse, *Gleanings,* by H. Q. Miller, possesses some rather good lines, a friendly philosophy, and here and there an expression of Nature-love. "Messin' Round My Dog" was the reviewer's favorite. Published by Dorrance and Co., Inc., 368 Drexel Building, Philadelphia, for $1.75.

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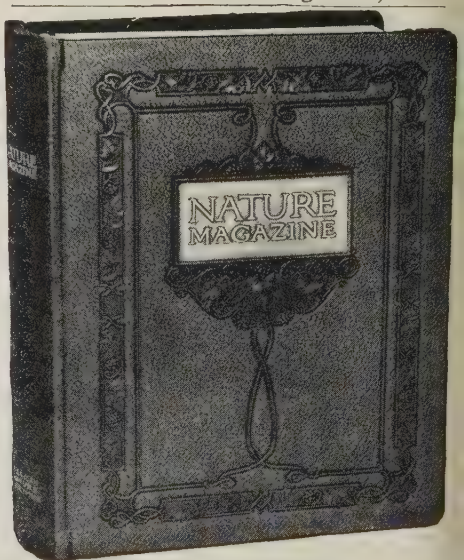

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For the Student

A somewhat new approach to the vast subject of Botany is given by William J. Robbins and Harold W. Rickett, both of the University of Missouri, in their newly issued book, *Botany*, published by D. Van Nostrand Co., Inc., New York. Rather than introducing the field as most college courses do—with the self-deluding idea that all students will later on take their majors therin,—this work is designed principally for those who probably never will go farther than Courses 1 and 2; it presents fundamental biological principles, and attempts to point out the scientific method and the aim of science, rather than to dole out unrelated facts by the academic yard. The plan of the book is very orderly, leading from the fundamental structure of plants through growth, life and death, and the origin of life, which naturally suggests bacteria, yeasts, etc. and forms a bridge to the evolutionary study of ferns, bryophytes, angiosperms and other forms. There is no question about the authority for the facts stated in this volume, and it should fill very comfortably the gap which has always existed in the botany textbook shelf. The price is $3.75.

Sunlight and Health

There has been no field of therapy, except perhaps that dealing with vitamins, which has been exploited and victimized by charlatans and pseudo-medical commercial firms more than the ultra-violet ray field, and any authoritative information on the subject is indeed welcome. Ronald Millar, in collaboration with Dr. E. E. Free, has brought out a book, *Sunrays and Health*, which gives a sane, clear, and popular presentation of the use of these rays, the possibilities of abusing them, the diseases they will help to prevent, and their value when artificially created. A race of "Sundodgers", as Mr. Millar characterizes the American people, we do not absorb normally enough of the sun's rays to get above the stage of feeling "pretty good"; this little volume may help increase our physical fitness as well as to warn against unsound "sun" ideas. It is published by Robert M. McBride, New York, for $1.50.

The Year 2000

While most of us are having plenty to do trying to take care of the year 1929, members of a Joint Committee on Bases of Sound Land Policy, organized by the Federated Societies on Planning and Parks, have set their faces squarely forward to speculate on the tremendous demands on the 3,026,789 square miles of land in the United States that will be made when the century closes by the 187,000,000 people who will be probably living on it at that time. In their survey, printed under the title, *What About the Year 2000?*, they seriously urge planning at least a hundred years in advance, to make best use of the land; they urge particularly preservation of tracts for state and national parks, forests in each section sufficient to supply the locality, and better agricultural methods so that the amount of land planted to crops in 1919 will serve to supply the increase in population which will come. Prevent rather than cure land famines, the committee advises. Published by J. Horace McFarland, Harrisburg, Pennsylvania.

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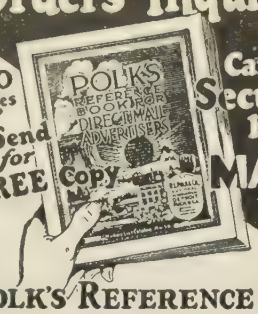

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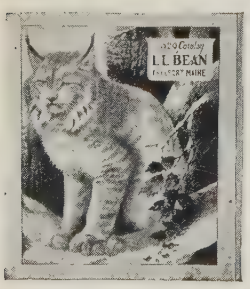

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COAST TO COAST FOR COLUMBINE

(Continued from page 181)

tion of Women's Clubs, met Miss Brainerd at the airport, replenishing her corsage before she again took to the air. The Round Table Luncheon Club at Kansas City, Missouri, met the flyer when the huge Transcontinental Air Transport Co. plane lighted for a few minutes there. On the West Coast, the Nature Study Club of Southern California, represented by Miss Hooks and Mrs. Susan M. Hutchinson welcomed the campaigner, offering her fresh flowers.

A bouquet was also presented to Mrs. Charles A. Lindbergh, who accompanied her husband as he piloted the inaugural flight from Clovis, New Mexico, to Los Angeles. It will be remembered that columbines were part of Mrs. Lindbergh's bridal bouquet, picked for her by Colonel Lindbergh in her father's garden just before the ceremony.

Boosters of the columbine are expecting that Miss Brainerd's flight will be one of the deciding factors in the remaining months of the campaign. The polls close December 1, and the American Nature Association requests all those who have not balloted to express their choice at once.

The standing of the leading candidates, before press time, was as follows:

Wild rose	338,354
Columbine	142,930
Violet	77,993
Goldenrod	63,405
Phlox	28,965
American Beauty Rose	12,230
Daisy	10,565
Dogwood	9,674
Mountain Laurel	8,760
Scattering	18,238
TOTAL	711,114

Regarding Our Printers

The grounds of the Condé Nast Press, at Greenwich, Connecticut, where each month Nature Magazine is printed, are as colorful and beautiful as any Southern garden, and are indicative of the high type of beauty these printers turn out in magazine form, and of the order and dignity which prevails within the plant. It remained for a visitor from Europe, however, to attempt an evaluation. M. Louis Baschet, general manager of *L'Illustration*, a French illustrated weekly, wrote Mr. Nast after his trip: "From nowhere we keep a better impression than the one we had when we visited your Greenwich plant. Not only is it extremely pleasing in its outside appearance, looking like an English castle in the middle of a beautiful garden, but, inside, one notes, in every department, organization, good methods of production, up-to-date material. Your people seem happy to work and proud to cooperate in the fabrication of magazines of quality and fame. It is no compliment I pay you. It is the sincere expression of what we think and of what we have noticed."

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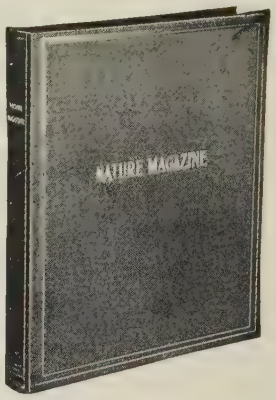

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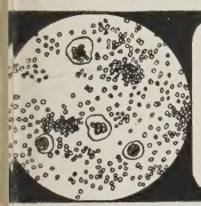

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Avoiding Poison Ivy

"Avoid three-leaved plants as you would poison," advises Farmer's Bulletin 1166-F, issued by the U. S. Department of Agriculture, "and you will escape poison ivy, oak, picry, mercury and other joy-destroying wood denizens that prey on picnic parties and berry expeditions." All these toxicodendrol-bearing plants have three leaves, with the exception of poison sumac, and all have white fruits. If one has been exposed to the poison, however, the bulletin urges thorough washing with soap, not once, but three or four times. Potassium permanganate is perhaps the best remedy, once the poison is working, according to the department. The bulletin is sent on request.

Clever Airmanship

Men jumping from planes to automobiles, or catapulting in airplanes from the decks of moving cruisers may well pause to wonder at the brilliance of their own feats as compared with the act of "Bright Eyes," a homing pigeon, who landed, unaided and without special apparatus, on the window sill of a passenger train moving between Kansas City and Atlanta, Georgia at the rate of 45 miles an hour one lowry day in June. The bird, a participant in the Charleston, S. C.-Birmingham, Ala. annual 500 mile race, became weatherbound, and hopped the train like any hobo. He was taken into the cars, and later identified as belonging to T. G. Goodwin of Charleston; when released, he promptly flew home. And Alderman Williamson, the conductor on the train, is still wondering whether or not he should collect a baggage charge.

Dog Counts Birds

Using a clever, hard-working Gordon setter as a bird-counter nonpareil in the national bird census is the achievement of Professor H. M. Wight of the School of Forestry and Conservation of the University of Michigan. Max Berry, the setter, pointed about 1000 birds in 1928, and travelled 10,000 miles on the running board of an automobile to amass this total. He knows the difference between pheasants and bob-whites, and is invaluable in discovering for humans the location of each bird and the kind of cover in which it is found. Tests show that he is as good a counter as human beings. Perhaps his example will be followed by other bird dogs, and their owners will find as great a pleasure in flushing out the birds and listing them, as in religiously reducing their numbers.

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The Trumpeter's Call

Owing to the exigencies of physical make-up, the last paragraph of the article by Margaret E. Thompson Sheldon entitled "The Trumpeter's Last Call", in our July issue, was added to the text. This paragraph, anti-climactic in character, detracts from a delightfully interesting article notably well written. This article should be read and considered without its concluding paragraph, to get its full beauty.

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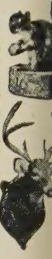

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The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

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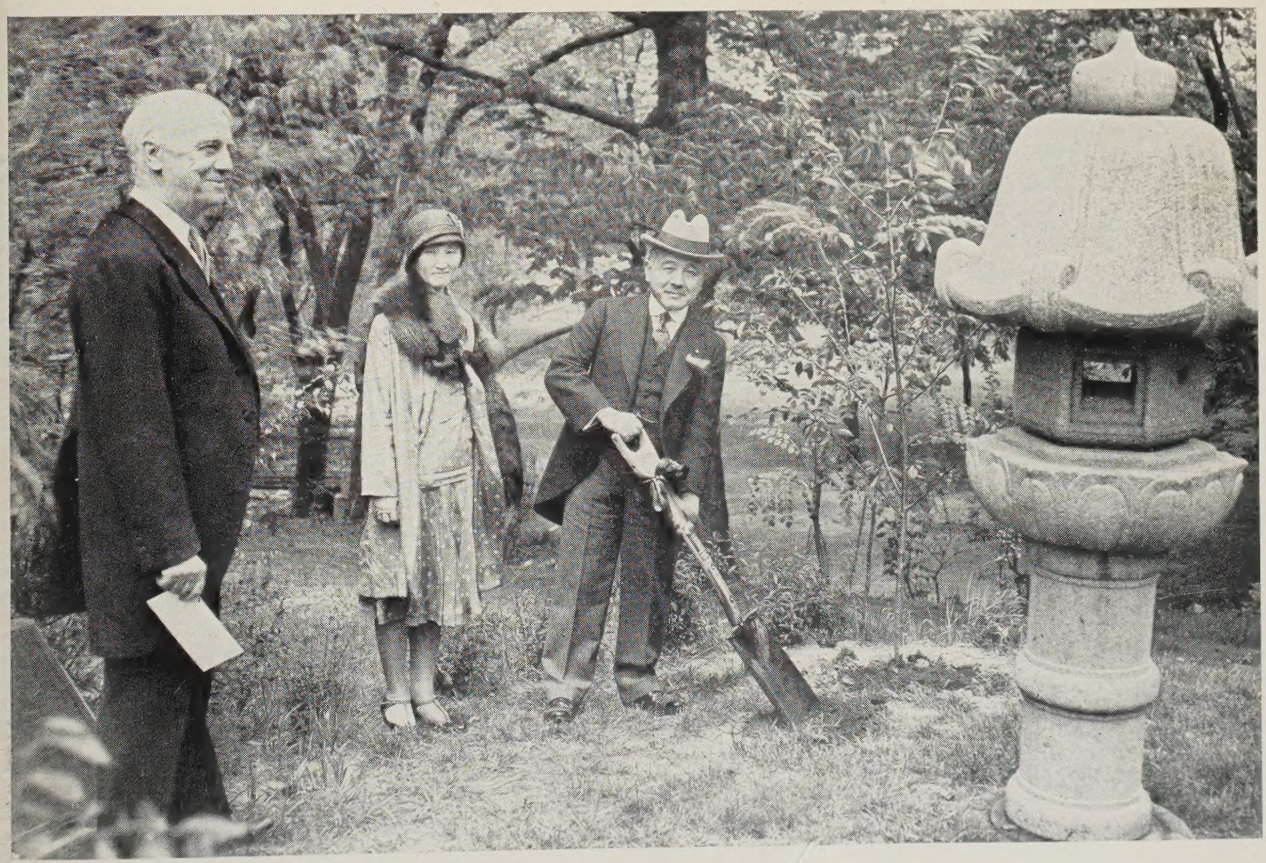
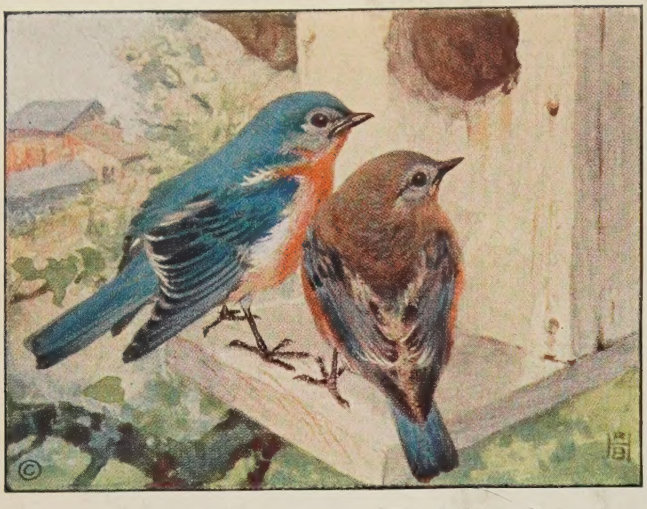
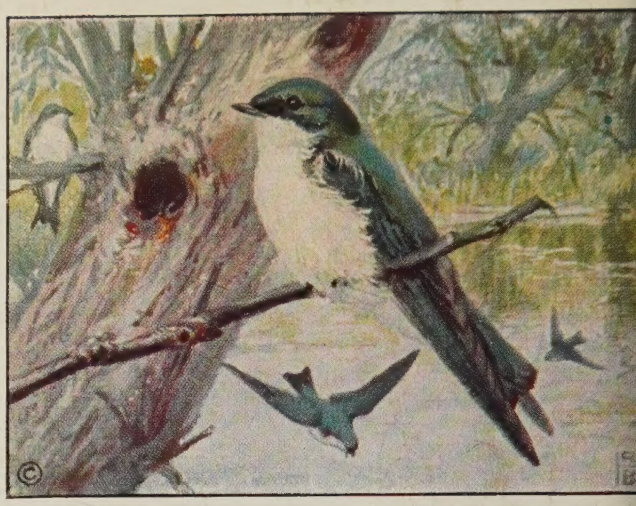
DURING Journalism Week at the University of Missouri the Japanese and Mexican Ambassadors to the United States joined the tree planting army. The certificates of membership in the American Tree Association were presented by Dean Walter Williams of the School. He is shown at the left in the lower picture with Madame Debuchi and Mr. Katsuji Debuchi who planted his tree near the Japanese stone lantern, a gift to the school. In the upper picture are Mr. Manuel C. Tellez, the Mexican ambassador, and Madame Tellez. His tree was placed near Jay H. Neff Hall, the home of the school on the University campus. Now that the tree planting season is at hand the American Tree Association will send committee heads, scout leaders and those in charge of planting a tree planting book. This tells you how to plant, suggests a tree day program and contains other valuable information. Now is the time to organize. The tree planting can be made an integral part of the roadside beautification program which is being furthered in so many parts of the country. Perhaps there is opportunity for a town forest near your community. In either of these plans every one can have a part. As a rule the highways approaching many towns need beautifying. Here is a project in which the women's clubs, civic and business organizations can join with the schools. As a maker of citizenship there is nothing better than the planting of trees, according to Charles Lathrop Pack, president of the American Tree Association. Tree planting, he says, brings out the community spirit as nothing else does. At the same time the individual and the community answer the association's call to celebrate the centennial of Arbor Day in 1972 by planting the trees now. What fine delegates, trees, will represent you on that date if you heed the call. Now is the time to organize. Send to the American Tree Association for tree planting suggestions and application blanks so that certificates of membership making you a member of the tree planting army may be sent you, too.





BLUEBIRD—*Sialia sialis*



TREE SWALLOW—*Iridoprocne bicolor*

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